ABORTION AND AUTONOMY IN URBAN UTTAR PRADESH, INDIA

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ABSTRACT

Jennet Louise Arcara: Abortion and Autonomy in Urban Uttar Pradesh, India
(Under the direction of Ilene S. Speizer and Sandra L. Martin)

Despite India's 1971 legalization of abortion, unsafe abortion remains a leading cause of maternal mortality. However, women's autonomy may be a facilitator to safe abortion. This dissertation used longitudinal survey data to examine how autonomy is associated with abortion-related health behaviors and experiences among married women aged 15-49 in six cities in Uttar Pradesh, India.

The first study used multilevel models to determine how women's autonomy, individual- and community-level characteristics, and community gender norms are linked to abortion attainment. We estimated associations between baseline community-level gender norms and individual deviance from norms in several areas of autonomy (financial, mobility, marital control, and reproductive) and abortion attainment among 1,703 women. A cross-level interaction indicated that the likelihood of abortion rises as both a woman's financial autonomy compared to her community rises *and* her community's overall financial autonomy rises.

The second study used logistic regression to examine associations between baseline autonomy, community gender norms, and social networks and self-managed abortion (abortion performed without a doctor or nurse; usually, but not always, using medication) in 310 women who reported an abortion between 2009-2014. Sixteen percent of women reported self-managed abortion (SMA), and of these, 75.40% were medication abortions and 74.94% reported no side

effects or complications. Women in communities with more financial autonomy were more likely to report SMA.

In this dissertation, the more monetary control that women in a community had, the more likely they were to obtain an abortion and to choose a self-managed abortion. SMA may be more discreet than facility-based abortion, which likely appeals to more vulnerable women and women in crowded urban neighborhoods where information and stigma spread quickly. However, women with the most education were more likely to choose facility-based abortion, likely reflecting the distinction between autonomy (e.g., financial autonomy) and status (e.g., educational achievement). Resources, such as money or social relationships, are key in enabling autonomous abortion decision-making, and autonomy or status due to different types and sources of resources may have a differential influence on women's choices around abortion experience.

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AIC	Akaike information criterion
CHW	community health worker
CI	confidence interval
DHS	Demographic and Health Survey
DLHFS	District Level Household and Facility Survey
GLLAMM	generalized linear latent and mixed model
ICC	intraclass correlation
ICRW	International Center for Research on Women
IPV	intimate partner violence
MA	medication abortion
MAMTA-HIMC	MAMTA-Health Institute for Mother & Child
MLE	Measurement, Learning & Evaluation Project
MMR	maternal mortality ratio
MOR	median odds ratio
MTP	medical termination of pregnancy
NFHS	National Family Health Survey
NGO	non-governmental organization
NSS	National Sample Survey
OR	odds ratio
PSU	primary sampling unit
RDS	respondent-driven sampling
SD	standard deviation

SE	standard error
SMA	self-managed abortion
UHI	Urban Health Initiative
UN	United Nations
UNC-CH	University of North Carolina at Chapel Hill
UP	Uttar Pradesh
URHI	Urban Reproductive Health Initiative
WHO	World Health Organization

CHAPTER 1. INTRODUCTION

1.1 Background

1.1.1 Unsafe abortion as a leading cause of maternal morbidity and mortality in India

Unsafe abortion—defined as an abortion performed by an unskilled provider or in an environment that does not meet minimum medical standards, or both[1]—is a leading cause of maternal mortality worldwide.[2,3] Approximately half of the estimated 56.3 million abortions that take place annually around the world are considered unsafe, an increase since 1990 in both the proportion of abortions that are unsafe and in the absolute number of unsafe abortions.[4-6] Unsafe abortion accounts for approximately 13% of all maternal deaths—a proportion that has remained the same even as the annual number of maternal deaths has declined.[4]

The contribution of unsafe abortion to overall maternal mortality in South Asia mirrors the worldwide proportion, with unsafe abortion contributing to an estimated 13% of all maternal deaths.[2] In India, the most recently available data estimates that between 8[7,8] and 11%[2] of the approximately 45,000 maternal deaths per year[9] in the country are due to unsafe abortion. While the overall number of maternal deaths has decreased in India, the proportion of maternal deaths attributable to unsafe abortion has remained relatively stable over the past three decades.[10,11] While India's maternal mortality ratio (MMR) has decreased in recent years, maternal deaths in India still comprise approximately 15% of all maternal deaths in the world—the second largest number of maternal deaths in any one country.[9]

1.1.2 Abortion in India overview

Legal and policy environment

Abortion has been legal in India since 1971. A variety of health, social, and economic reasons, including contraceptive failure for married women, are cited in the *Medical Termination of Pregnancy Act, 1971* as allowable reasons for termination of pregnancy up to 12 weeks with one registered provider's approval or up to 20 weeks with the agreement of two registered providers.[12] Spousal consent is not required. However, despite the legal standing, lingering stigma, access, and implementation difficulties have made assessing the incidence and characteristics of abortion in India challenging.[13,14]

Incidence estimates

The most recently collected large-scale, multisource data estimates that 15.6 million abortions occurred in India in 2015.[15] This is significantly higher than previous estimates, which were between one and seven million abortions annually.[16-18]

Estimates from government-based surveys are lower, with significant underreporting likely the reason for the lower estimates. In 2015-16, the National Family Health Survey-4 (NFHS-4) reported that 3.4 of pregnancies in the five years preceding the survey ended in abortion.[19] The 2014 National Sample Survey (NSS)—an Indian government survey—indicated that about 2% of pregnancies in rural areas and 3% of pregnancies in urban areas ended in abortion.[20] Urban women under age 20 had the highest rate of abortion, with 13.6% of pregnancies ending in abortion.[20] The older District Level Household and Facility Survey (DLHFS) 2007-2008 indicated that about 1.8% of all pregnancies ended in induced abortion, with slightly higher rates among wealthy, educated, and older women.[21]

Comparison of incidence data is complicated by differences in methodologies and the specificity of data that is able to be collected due to abortion-related stigma. For example, the NFHS does not report the proportion of women who have ever had an abortion, only the non-disaggregated ever experience of a non-live birth (which includes miscarriage, stillbirth, and abortion) and abortions reported in the five years preceding the survey. In community-based studies, more in-depth and specific data collection (e.g., disaggregated ever experience of miscarriage, stillbirth, and abortion) may be possible when communities are more comfortable with non-governmental data collectors and indeed, women self-report abortion rates that are considerably higher than government household surveys and facility surveillance.[16,20-23] In Madhya Pradesh, 15% of women in a community-based sample reported having had at least one completed abortion, with 23% having attempted an abortion.[16] In studies specific to urban slums, previous studies in Delhi have found between 16%[24] and 25%[25] of women reported at least one induced abortion, and a study in Mumbai found 20% of women reporting at least one abortion.[26]

Characteristics of women seeking abortions in India

Analyses of the NFHS-1 (1992-93), NFHS-2 (1998-99), DLHFS-3 (2007-08), and NFHS-4 (2015-16) have found that, while there is considerable variation by state, in general, older, wealthier, urban women are more likely to report having had an abortion.[19,21,27-32] However, given the known underreporting of abortion, it is also very possible that older, wealthier, urban women are actually only more likely than younger, lower-income, or rural women to *report* their abortions because they feel less stigma, are less concerned about privacy and government-sponsored household surveys, or for other reasons. Studies have also found a connection between a number of indicators of women's status and abortion. Education level,[30,33,34] literacy,[27,29] type of work,[29] caste,[27,29,33,34] and standard of living,[29,33] all affect

women's likelihood of having an abortion. Some effects differ by region: while more educated women and high caste women are more likely to obtain an abortion throughout the country, participation in non-agricultural work seems to be a significant factor in abortion-seeking only for northern women.[29] Additionally, age at marriage is also related to experience of abortion, with women married at older ages more likely to have terminated a pregnancy, possibly because sex-selective abortion is more likely for women who have fewer years remaining to bear sons after marrying at an older age.[29]

1.1.3 Can autonomy play a role in access to safe abortion?

Autonomy and empowerment theoretical underpinnings

Women's autonomy (also sometimes termed "agency") can be defined as the ability to define goals and act upon them; it can encompass multiple domains, such as financial decision-making or mobility.[35] Autonomy combines with the resources (such as finances, education, or social relationships) that enable action and achievements to comprise the broader concept of empowerment.[35] Empowerment can be conceptualized as a process that may be influenced by a wide range of events and contexts at multiple levels within women's lives.[36-39] While the concept of autonomy indicates an individual's power or control over her life, the concept of empowerment includes collective power as well.[40]

Both autonomy and empowerment are necessarily multidimensional and women may be autonomous or empowered in one domain but not others. The literature typically distinguishes between several primary domains of autonomy, all of which overlap and can affect each other:[41] financial or economic, mobility or freedom of movement, decision-making (e.g., about healthcare for oneself, one's children, contraceptive use, visiting friends or family), ability, and reproductive autonomy.[35,36,42,43] Marital control, attitudes towards gender-based violence,

emotional autonomy (egalitarian power relations in the home that allow for bonding and intimacy between partners), knowledge (as opposed to education) autonomy, leisure or ability to self-indulge, and others are also used or recommended as additional or alternative conceptualizations of the dimensions of autonomy.[41-44] The multiple dimensions of autonomy and empowerment vary by cultural and societal context, and consequently, markers of autonomy in one locale may not be the same in another.[36] Individual women's autonomy may fluctuate throughout their life course in relation to life events and community and societal contexts, but overall change and large-scale movement towards empowerment may take significant time and follow incremental steps.[37,45]

Factors associated with autonomy

A woman's autonomy does not develop in a vacuum: household dynamics, community norms, and other sociodemographic factors strongly influence individual women's autonomy.[29,36,41,46,47] In India, a number of individual, familial, and community-based sociodemographic and other factors influence both autonomy and reproductive behaviors.[16,33,46,48,49]

Education generally increases women's autonomy, though the extent of the effect can vary by domain of autonomy and with other characteristics such as the baseline level of autonomy already available to women through the local kinship structure; in some environments, it may take very high levels of education to achieve any change in autonomy.[44] Individual and household economic activities and status also affect autonomy, though the effect appears greater where fewer women participate in work outside the home.[44] Religion has also been put forward as an influence on autonomy, though significant research asserts that varying social structures

(i.e., differences in kinship structures in North India vs. South India) that allow women different levels of control is a greater influence.[47,50]

The composition and structure of households in India, including both sex and age, affects a woman's role in the household, and in turn, her autonomy.[45,48-50] Mothers-in-law wield particular power within the household, including power to allow or disallow younger women to visit their natal families; the power dynamics between mothers-in-law and daughters-in-law are mirrored by older daughters-in-law and younger daughters-in-law.[44,48] Relatedly, size of dowry may impact autonomy, particularly in the most traditionally-composed households in North India.[44] Early marriage additionally reduces young women's autonomy within the household.[51,52]

Recently, theoretical and analytical work has also flipped the conceptualization of autonomy to suggest the influence of reproductive life events on empowerment, encompassing the broader view of empowerment as a process that may be influenced by a wide range of events and contexts within women's lives.[36-39] This perspective theorizes that certain reproductive life events, such as birth of children (particularly sons), is a factor in increasing women's empowerment[45,46,53-55] and that the culmination of a variety of reproductive events and experiences over the life course affects women's empowerment.[37,38] It has also been theorized that fertility decline on the national level is a driver that increases empowerment as it broadens the time, resources, and perspectives available to women (and men) when sexuality is decoupled from procreation and contraception allows women to spend smaller proportions of their lives on childbearing and childrearing.[39]

Autonomy and reproductive health outcomes

Autonomy and empowerment have long been linked to reproductive experiences and health.[36,37,49] Traditionally, the relationship has been hypothesized that women's autonomy and

empowerment influences reproductive behaviors and health, though most research has been cross-sectional and cannot fully distinguish the direction of effects.[36-39,56,57]

A significant amount of research throughout the world and in India has found that women with more autonomy and/or empowerment (operationalized in a variety of ways) are more likely to use contraception[58-62] and have lower fertility,[53,63-68] though the relationship between specific domains of autonomy and family planning and fertility outcomes has not always been consistently in the same direction.[36,57] For example, current use of contraception appears to sometimes show positive relationships with autonomy, rarely negative associations, but most often, no relationship.[57] Analyses of the association between autonomy and ever use of contraception and between autonomy and future intentions to use contraception show similar results.[57] Similarly, most research addressing autonomy or empowerment and fertility intentions has found that higher levels of autonomy or empowerment translate into lower preferred family size, greater spousal communication around fertility, and a greater ability to make fertility decisions, but there is attenuation where the effect of the community is included and differences in significance and directionality of results among domains of autonomy or empowerment.[36,41,53,58,69-75] Autonomy, particularly freedom of movement, has been shown to be a determinant of maternal health care access, though some results around pregnancy care have been mixed.[48,76,77] Domains of autonomy or empowerment have also been linked to sexual decision-making and sexual health outcomes[78] and experience of intimate partner violence (IPV).[79]

Autonomy, unwanted pregnancy, and abortion

We might expect women with higher autonomy to be less likely to have unwanted pregnancies, as they should have more control over their use of contraception.[36,57] A more

autonomous woman should be more likely to use contraception (and to use more effective methods of contraception) and thus have fewer unwanted pregnancies. Increased use of contraception to control fertility might then translate into *fewer* abortions for some of the most autonomous women, even as these women should also be most likely to be able to obtain an abortion when needed. The least autonomous women might be expected to use effective contraceptive methods less frequently and thus have more unwanted pregnancies; we might also expect these women to have a more difficult process to terminate a pregnancy, as obtaining an abortion is arguably more difficult than obtaining contraception. However, given the multidimensional nature of autonomy, it is also possible that autonomy that results in the ability to obtain and use contraception does not necessarily also result in the ability to obtain an abortion.

Several studies in the Philippines, Colombia, and Bangladesh have examined autonomy and unwanted or unintended pregnancy.[80-83] Williams and colleagues'[83] mixed methods study in the Philippines included income and education proxies, as well as emotional autonomy and fatalism, and found that lower income and higher fertility fatalism were predictive of unintended pregnancy primarily for rural women. Analysis of the 2003 Philippines Demographic and Health Survey (DHS) separated unwanted and mistimed births and found that women with more household and sexual autonomy had lower risk of unwanted births, but not mistimed births.[80] In Bangladesh, analysis of the 2007 DHS showed that as women scored higher on a five-point autonomy scale, they had increasingly lower odds of unintended pregnancy (both unwanted and mistimed births) after adjusting for other variables.[82] Pallitto and O'Campo's[81] analysis of the 2000 Colombian DHS is the only study to incorporate more than individual-level analysis; their multilevel logistic regression analysis found that living in an area with high patriarchal control

and high rates of IPV increased women's risk for unintended pregnancy, though community-level autonomy and women's status did not significantly increase women's risk for unintended pregnancy. The exception to this was abused women who also lived in an area with high autonomy—they were more likely to have an unintended pregnancy. The individual autonomy level of abused women in these areas is not described, and it is possible that the counterintuitive finding is related either to lower autonomy in the abused women compared to the women around them, or is similar to the situation in a number of places around the world where women's empowerment is improving, but IPV increases in reaction to it.

For many women, termination of pregnancy might be the next step after an unintended pregnancy. Although women's autonomy—particularly mobility and financial decision-making—likely directly influences the ability to navigate access obstacles and obtain abortion services, there is a lack of research on autonomy and abortion, especially that which includes autonomy indicators instead of status indicators.[36] Few studies focus on autonomy and abortion with explicit inclusion of dimensions of autonomy instead of proxy measures of women's status, and of those that do, three of them[37,38,84] use the same dataset.[27,85-87] An additional two studies are able to address abortion only with proxy or women's status indicators.[29,33]

Rominski et al.'s[85] study in Ghana used a summary score of five behaviors (freedom of movement, discretion over earned income, economic decision-making, ability to control sexual relationships, health care decision-making) to evaluate the relationship between sociodemographic determinants, autonomy, and abortion. The authors found that higher autonomy was strongly associated with increased likelihood of having ever obtained an abortion even when other factors were controlled. However, they also draw particular attention to the question of whether increased autonomy may in fact only indicate an increased likelihood of

reporting abortion. In Turkey, Akin's[87] mixed methods study looked at both women's status indicators and constructed measures of gender norms and attitudes towards gender-based violence. The primarily descriptive study showed that women with less equitable gender views and women who lived in areas where overall gender norms were less equitable used less effective contraception, had fewer abortions, and had higher fertility. Women who were working were using more effective contraception and thus also had fewer abortions than women who were not working. In this case, the husbands' control, following the local norms, restricted women's ability to both use contraception and access abortion in the case of an unintended pregnancy.

In India, Agrawal's[27] analysis of the 1998-1999 NFHS-2 found that both proxy measures of autonomy (literacy, wealth) and an autonomy scale (including control of finances, decision-making, and mobility) were associated with experience of abortion, though the gender composition of existing children was a stronger predictor. Also using the NFHS-2 but with only proxy women's status measures, Bose and Trent[29] found that literacy, caste, and higher standard of living were associated with experience of abortion, particularly in North India; again, son preference was also strongly associated with experience of abortion. Similarly using primarily indicators of women's status, Elul's[33] analysis of a survey from Rajasthan showed likelihood of abortion increased with older age, higher caste, and higher standard of living. This is one of the few studies to include approximation of community-level contextual effects, and community knowledge of sex-selective abortion also appeared to increase the likelihood of individual women's termination of pregnancy. Taken together, this may suggest that although women with more autonomy or status by certain measures may be more likely to obtain abortions, the driver may also be ideal family composition or son preference (which is itself an indicator of structural

gender norms) coupled with the access to abortion that money facilitates. Alternatively, Paul's[86] qualitative study of young married women found that abortion was used as a means for women to have reproductive autonomy within the confines of social norms; fertility expectations meant that women were not able to openly use contraception, but when an unwanted pregnancy occurred, women used abortion to stay within the two-child norm—without regard to the fetus's sex and without apprising the mother-in-law of the pregnancy (and subsequent abortion).

Analyses of a hybrid "narrative" quantitative survey in Madhya Pradesh[16] show that more education, experience of domestic violence, gender composition of living children (i.e., at least one surviving boy child), and a combination of additional individual and household fertility preferences influence women's likelihood of seeking an abortion.[37,38,84] Interestingly, the findings on mobility restrictions are mixed. Women's own fertility preferences had the strongest effect on the odds of attempting abortion, with their husband's preferences—particularly when the couple agrees that they do not want another child—influencing both abortion-seeking and the use of surgical abortion; in-laws' preferences had a weaker influence.[84]

While most of the evidence seems to reflect that women with higher individual autonomy and higher status in society and the household are more likely to obtain an abortion, two findings—experience of domestic violence and having more mobility restrictions in the Madhya Pradesh study and keeping the pregnancy and abortion a secret from in-laws in the qualitative study—seem to reflect an enigmatic situation whereby women with less autonomy or status in the household are comparatively more successful at terminating pregnancies. In these situations, the household influence on pregnancy termination is as strong as or stronger than the influence of individual autonomy, but in a paradoxical way: these women may be more likely to experience an unintended pregnancy because of their lack of empowerment, but when faced with

the pregnancy, they may then assert reproductive control by obtaining an abortion. The unequal power in the household pushes women towards abortion as a means of controlling their reproduction even while their individual autonomy is low.

1.1.4 Abortion decision-making: process and reason for seeking an abortion

At each stage of the abortion decision-making process, women's sociodemographic characteristics, their stage in life, their family and community, and macro-level societal factors and policies can affect women's practical and ideological considerations, the options available, and ultimately, the final decisions that women make.[88-91] While most women have made their decision to abort prior to accessing health care services and have high certainty about it, barriers in accessing care—whether as a result of knowledge, geography, the health care system's structure, or legal/policy restrictions specifically intended to reduce access—can often create gaps that affect how women make an abortion decision, the timing of a decision and an abortion, and the resulting decision itself.[89,92-94]

As much of the research on abortion in developing countries focuses on assessing abortion incidence and prevalence, less has examined the process of how women make the decision to abort.[16,95] A proposed framework for unsafe abortion for the state of Madhya Pradesh starts with unwanted pregnancy and moves directly to the need for abortion services, with access barriers following, and finally, unsafe abortion, complications, and health outcomes.[96] Notably, there is no explicit inclusion of the decision to abort itself.

Given that the abortion decision may not be the woman's alone and that myriad external factors also influence her decision, understanding the process through which women initiate and reach a decision about abortion—and who contributes to or ultimately makes that decision—is key to understanding issues of access. Patriarchal power structures in households can restrict

women's access to family planning information and services.[97] Differential power structures may be reflected in differences in age, education, and working status between husband and wife, where the husband may have increased power due to age, earning power, or having more education, or conversely, power balances may be upset by a husband's perceived decreased power due to the wife earning income or becoming educated.

The decision-making process of whether to have an abortion or carry a pregnancy to term is reflective of the communal household structure that is common in India; husbands[26] and parents-in-laws (particularly the mother-in-law) are likely to participate in the decision or even be the primary driver of the decision, particularly if son preference is involved.[10,86,98,99] Conversely, almost 20% of women in one study in a Mumbai slum reported that when their husbands did not agree to the abortion, the women sought assistance from friends and neighbors to obtain it anyway.[26] Caste differences may also dictate who contributes to abortion decision-making, as one study in Gujarat and Haryana showed that only higher caste women had to get permission from their in-laws, while lower caste women needed permission only from their husbands.[99] Several studies also show that women more often receive information on abortion from their networks of family and friends than from health care workers, and women who receive information on abortion in this way are more likely to seek termination of a pregnancy.[13,26,33]

Women in India most commonly report that the reason for abortion was a desire to limit family size or space their births.[34,99] Sometimes this may also be due to economic constraints that would make having a(nother) child untenable.[10,17,34,99-101] There is also some indication that women may use abortion as a method of family planning precisely because of the high premium placed on fertility and an unwillingness to use reversible contraception methods for fear of

infertility. Some women may seek abortions instead of using contraception in order to confirm their fertility but still space their children until they have completed childbearing, at which point, a permanent method of contraception is sought.[102] Taboos about sex without intending pregnancy may mean that contraceptive use is not possible, but if pregnancy occurs, women may use abortion as a means of reproductive control.[86]

The preference for an ideally composed family that includes two sons and one daughter also appears to influence abortion-seeking. One study in Madhya Pradesh found that women with this family composition were 90% less likely to want any additional pregnancies and were more than twice as likely to use abortion or sterilization to limit their families.[103] Two-child families are also becoming more popular: overall, the proportion of women with two children (of any sex) who do not want additional children increased from 60% to 83% from 1990 to 2005, indicating increasing acceptance of the two-child family that the Government of India has been promoting for the past forty-plus years.[42,86] Taken together, the current evidence on ideal family composition and son preference indicates that, while state-level differentials continue to exist, son preference does not actually appear to influence abortion rates at the national level.[10,30,104,105]

1.1.5 Relative safety of abortion: facility types, providers, and methods

Women in India may resort to unsafe providers or locations for a number of reasons including lack of awareness of abortion's legality, lack of trained providers and facilities, geographic accessibility of facilities, cost, confidentiality, stigma, or a fear of being mistreated.[17,98,106,107] Sporadic or nonexistent service provision due to staff, facility, and equipment shortages[10,98] impedes access in both rural and urban locations.[10,13,14,17,108,109] This disproportionately affects the poorest women, for whom the lowest-level public facilities are often the only point of health care delivery.[10,110] Though public sector facilities from the primary

level up are mandated to provide abortions, the majority of women report going to a private facility for abortion services, even though the cost is higher.[21,34,111,112] However, some women do also perceive non-governmental organization (NGO) and private sector providers and facilities as having better services, equipment, facilities, and confidentiality.[17,99] Providers are also more likely to be more comfortable with and offer women surgical abortions owing to training foci.[10,13,17,113]

1.1.6 Abortion outside the formal medical system

In India, provision of any type of abortion is legally restricted to licensed doctors in registered facilities,[114] but in practice, somewhere between one-quarter and three-quarters of all abortions are estimated to occur outside of facilities, primarily through medication purchased at a pharmacy or drugstore.[19,115] Pharmacists in India are not legally allowed to dispense medication abortion (MA) drugs without a prescription from an accredited abortion provider.[116] Yet in practice, obtaining MA from pharmacists without a prescription is widely available;[117,118] women commonly visit pharmacies and drugstores when initially seeking abortion care and to purchase MA drugs.[10,112,119,120] Pharmacies outnumber and are more accessible than formal healthcare facilities—especially in urban areas—and in contexts where women are able to purchase MA drugs directly at a pharmacy, self-sourced and self-managed abortion also has potential to decrease the time, cost, and exposure of accessing care.[118,119,121] Indeed, as pharmacists and drugstore workers have varied knowledge of and expertise in MA regimens, policies and programs in India and South Asia more broadly have targeted pharmacist education as a strategy to expand access to safe abortion and decrease maternal morbidity and mortality.[118,119,122-125]

1.1.7 Complications

Complications of unsafe abortion are a leading cause of maternal death in India.[10,15,126] However, the dearth of data on abortion morbidity in general and the inherent difficulties in collecting information on abortions and abortion-related morbidity mean that the actual incidence of complications is poorly understood.[2,10,127,128]

Abortion complications in India appear to stem from several sources: unskilled providers' use of herbs and ineffective traditional methods;[84,96,129-132] incorrect self-administration of approved drugs or self-administration of ineffective drugs/methods;[96] and use of the more invasive dilation and curettage method by untrained providers and/or in an unhygienic location.[112,131,133,134] Women may start the process at home or with a traditional provider and, as complications develop or it becomes clear that the termination is incomplete, then seek out progressively higher levels of care.[96,135] In general, women most at risk of complications from unsafe abortion are thought to be the poorest, youngest, and most marginalized women in rural areas,[14,136] though at least one study shows that educated urban women are also at risk.[96]

1.1.8 Contextual influences on reproductive health

While older research focused primarily on individual-level determinants of reproductive health, much recent research has taken into account the contextual factors external to the individual or household, such as community gender norms, cultural beliefs, presence of health facilities, and other physical characteristics that influence health behavior and outcomes. Community-level factors such as inequitable gender norms, the proportion of educated women in the community, or community exposure to family planning messages have been shown to have significant effects on individual reproductive behaviors and outcomes, including contraceptive use,[137-139] unintended pregnancy, [81] fertility,[140] and antenatal care and skilled birth attendance.[141]

In India, community-level effects have been shown to influence both health behaviors, such as use of reproductive and maternal health services,[142] and health outcomes, such as pregnancy and delivery complications and achievement of desired fertility.[143] Though less commonly incorporated into multilevel analyses, women's autonomy at the community level has also been linked to contraceptive use.[41] Research has also indicated that community violence and permissive norms about spousal violence increase the likelihood of IPV[144] and community-level literacy and the educational context of the surrounding community decrease the likelihood of IPV.[145] At a more foundational level, community variation in the general socioeconomic environment and standard of living also impacts maternal healthcare utilization in India.[76]

1.1.9 The context of reproductive health and abortion care in urban Uttar Pradesh

The North Indian state of Uttar Pradesh (UP) is characterized by high rates of unwanted pregnancies, low female autonomy, and underfunded and inaccessible reproductive healthcare facilities, particularly for the urban poor.[15,19,109,117,146] Approximately 3.2 million abortions occur each year in UP.[117] Yet, only about 11.4% of abortions take place in facilities; the state, while the most populous in India, has the lowest number of registered abortion clinics per capita in the country and less than one-fifth of public facilities offer abortion services.[117] The Guttmacher Institute's 2015 study estimates that 83.4% of all abortions in the state are medication abortions occurring outside a facility;[117] in the 2015-2016 NFHS-4, 39.4% of urban women in UP report that they performed their last abortion themselves,[147] a significantly larger proportion than for urban women in India overall (22.9%).[19]

Initial evaluation of the endline Urban Health Initiative (UHI) data showed that 20-26% of women in six cities in Uttar Pradesh (Agra, Aligarh, Allahabad, Gorakhpur, Moradabad, and Varanasi) reported ever having an abortion, miscarriage, or stillbirth.[148] Wide variation was seen

in reporting of abortion when it was asked about independent from other fetal deaths: only 4.3% of women who ever miscarried, aborted, or had a stillbirth in Moradabad reported an abortion since January 2009, but 20% of women in Aligarh reported an abortion.[148] While the UHI project involved a variety of community and facility interventions, as well as a longitudinal study design with multiple contacts with study personnel per respondent, it is still a large-scale household survey with significant international and NGO involvement. This may influence women's willingness to reveal potentially stigmatizing (or in the case of sex-selective abortion, illegal) information. Thus, these estimates may still be an underestimation of the true extent of abortion in the six cities.

Moreover, UP is characterized by significant socioeconomic inequities that can make facility-based abortion difficult to obtain.[19,117,147] Cost and transportation problems can constrain women from getting to a facility, and women attending a facility may be turned away because of the staff's limited capacity, lack of training, incorrect understanding of the legality of abortion in different situations, and staff and providers' own biases and stigmas.[10,14,15,109,117] The lack of public sector facilities providing abortion disproportionately affects the poorest women, for whom the lowest-level public facilities are often the only point of health care delivery.[10,110] Familial and community social norms also stigmatize contraception and abortion,[19,117,147] even while the preference for an ideally-composed family of two sons and one daughter conversely appears to influence abortion-seeking throughout the country and in UP specifically.[29,103]

1.2 Significance and specific aims

There is little research in India or elsewhere that has addressed abortion from a comprehensive, contextual perspective and accounted for autonomy and the individual, family, and community influences on pregnancy outcomes.[33,36,57] Despite abortion's legality in India,

stigma and other societal influences result in a dearth of in-depth comprehensive information on women's experiences with abortion.[1,7,10,26,127,149-151]

We know that women's living situations matter for predicting family planning use and other reproductive health outcomes in urban North India,[152] but less is known about how that living situation combines with other aspects of women's lives (individual characteristics and autonomy, community norms and characteristics) to exert influence on pregnancy outcomes. While a few studies have included some household or community variables and expressed the importance of incorporating contextual influences, the results have been mixed and without consensus.[29,33,84] No studies that address autonomy's effects on abortion-seeking with a contextual perspective use a multilevel model to appropriately account for the multiple levels of influence.

Therefore, the overall objective of this study is to examine the context of abortion in urban Uttar Pradesh, India, to better understand how autonomy and sociodemographic factors interact to affect abortion-related health behaviors and experiences. It is important to more fully understand the constellation of factors that facilitate and constrain access to safe abortion services in order to strategically develop interventions to improve safe abortion access.

The aims of this dissertation are:

Aim 1 (Paper 1): Determine the effects of women's autonomy, individual and community sociodemographic characteristics, and community gender norms on attainment of abortion in a population-based longitudinal sample of urban women in Uttar Pradesh, India.

Aim 2 (Paper 2): Describe women's experiences with self-managed abortion in a population-based longitudinal sample of urban women in Uttar Pradesh, India. Examine

associations between self-managed abortion and sociodemographic characteristics, autonomy and community norms, and social networks and communication.

1.3 Theoretical frameworks

The complexity of the multidimensional concept of autonomy and the interactions among familial and social environments and individual characteristics and behaviors mean that no one theory is solely applicable to this project. Thus, this study draws from several theoretical frameworks: the theory of gender and power,[153] the socio-ecological framework,[154,155] Bandura's agentic perspective,[156] and the life course perspective.[45,157] Each theory discussed briefly below informs different aspects of the project, encompassing the multitude of forces that help shape women's lives at different levels and at different stages in their lives.

1.3.1 Socio-ecological model

The primary framework from which this dissertation draws is the socio-ecological model as developed by Bronfenbrenner[155] and advanced for health behavior by McLeroy.[154] These models take into account that individuals exist within an environment and system that influences them and that individual action or agency is not the only factor influencing health and behavior. McLeroy's socio-ecological model for health behavior comprises five levels: intrapersonal factors, interpersonal processes and primary groups, institutional factors, community factors, and public policy. In applications to specific health topics or behavior, this may be simplified and summarized into three or four levels, closer to Bronfenbrenner's original design of microsystems, mesosystems, and exosystems.[155,158,159] Given that the socio-ecological model posits that multiple levels of factors influence health behaviors and there are influences across levels, the multilevel conceptualization and analytic approach to this dissertation fits well.[159]

1.3.2 Gender and power

At a structural level, and influencing the overall context of women's lives, the theory of gender and power addresses the gendered relationships between men and women and the ways in which men's disproportionate power in society and decision-making controls women's lives.[153,160,161] Connell's structures of sexual division of labor, sexual division of power, and the structure of cathexis, or attachments and social norms, direct gender norms that flow from the societal and institutional levels to interpersonal relationships and individuals.[153,160] These gender inequities can then negatively impact both women's autonomy and women's health.[160-162]

1.3.3 Agentic perspective

Bandura's agentic perspective, a follow-on from self-efficacy, includes the idea of perceived control; that is, while one might have confidence that one can perform a desired action (self-efficacy), one also has to have confidence that the intended results of that action can be produced in the face of socio-structural influences (perceived control).[156,159] This concept can be directly seen in women's ability to use contraception or obtain an abortion: a woman may feel that she can obtain contraception from a health care provider and use it correctly, but if she also knows that any contraceptive products kept in her home will be found by her pronatalist in-laws, she has little motivation to actually use contraception. Consequently, she chooses to not use contraception so as to not disturb the norm, but when later faced with an unwanted pregnancy, she may independently control her fertility by obtaining an abortion.[86] In this way, while women's individual-level autonomy is incorporated into the framework of this dissertation, it does not have sole responsibility for women's actions and is mitigated by the social and environmental factors, such as household dynamics and local gender norms, that can inhibit women's full agency.

1.3.4 Life course perspective

The idea that empowerment is a process that is reflexive and changes over time in response to situations and life events[37,45] stems directly from Elder's life course perspective.[157] Elder proposed that the changing circumstances of one's life alters one's developmental trajectory.[157] The overall pattern and dynamic of a woman's life is influenced by events in her life and the environment around her, and her developmental trajectory changes as events happen in her individual life and in the world around her. When a woman's status in the household changes with the birth of a son early in her marriage, or a microcredit program targeting women's empowerment arrives in her village, her life trajectory is changed by a specific reproductive event and by the larger socio-historical context. Life course perspective is built into this dissertation in two ways: through the longitudinal data construction that is able to separate autonomy at different stages in women's lives and the proximity to reproductive events, and in the multilevel model that incorporates women's individual demographic events such as gender composition of children as well as the social and communal environment in which women live.

CHAPTER 2. STUDY DESIGN AND DATA COLLECTION

2.1 Study design

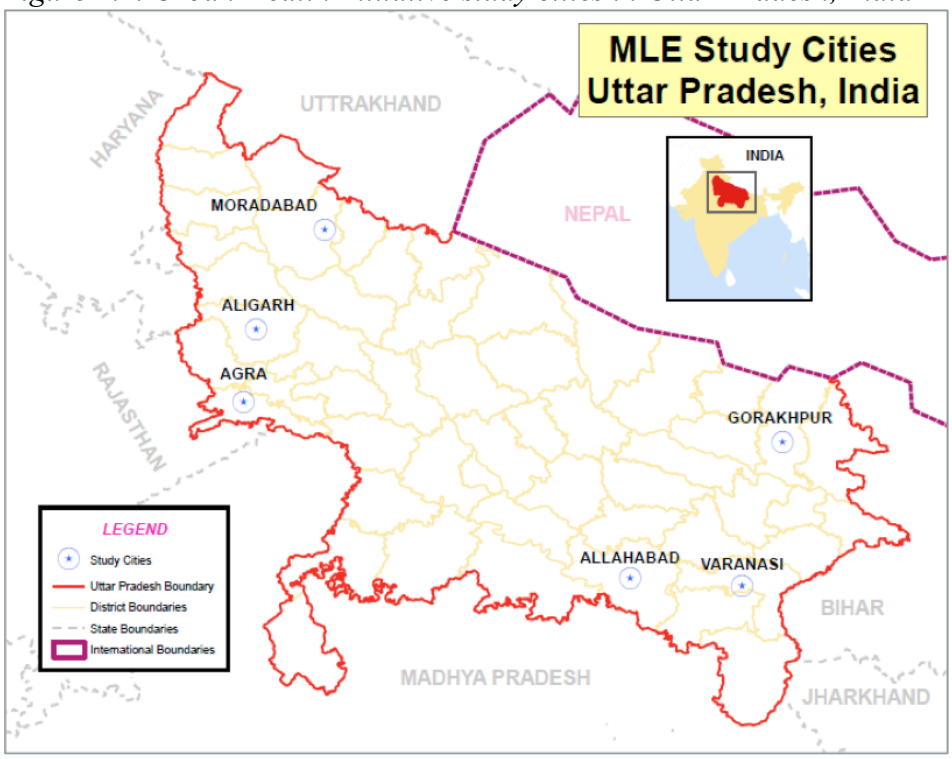
Data come from the Measurement, Learning & Evaluation (MLE) Project. The MLE project undertook the impact evaluation of the Urban Reproductive Health Initiative (URHI), a multi-country program funded by the Bill & Melinda Gates Foundation and implemented in India, Kenya, Senegal, and Nigeria. In India, the project is known as the Urban Health Initiative and was implemented by FHI 360. The UHI aimed to increase supply and demand for and access to modern contraceptive use, with a particular focus on the urban poor.

As part of MLE's evaluation, longitudinal data were collected from women in 2010 and 2014 in six cities of the state of Uttar Pradesh in North India (Agra, Aligarh, Allahabad, Gorakhpur, Moradabad, and Varanasi). Four cities (Agra, Aligarh, Allahabad, and Gorakhpur) received early treatment intervention by the project, creating a quasi-experimental design. Figure 2.1 shows the UHI study cities.

A multi-stage sampling design was used for the individual baseline survey in 2010. The sample frame was based on slum maps that identified slum areas in each city. Each study city was then divided into slum and non-slum areas, and primary sampling units (PSUs) were selected at random for both slum and non-slum areas. Using systematic random sampling, 30 households in each PSU were selected for the household and women's surveys. All selected households were visited and no replacement was made if a selected household was not present for data collection. All women ages 15-49 in selected households were eligible for interviews; up

to three visits were made to find women who were not at home at the time of interview. The urban poor were over-sampled, with over half of the sample each city living in slum areas, as compared to one-fifth to one-fourth of the population living in slum areas overall in the cities; study weights for each city make the samples representative of the entire study cities.[109]

Figure 2.1. Urban Health Initiative study cities in Uttar Pradesh, India



Slums were mapped and enumerated using a multi-step process using multiple spatial datasets, including satellite imaging, linkage to additional administrative data on slum boundaries, and field team review.[109,163,164] Based on the UN-Habitat and Government of India slum definitions, Uttar Pradesh's local definition of a slum defines slums as: areas where most buildings are dilapidated, overcrowded, lack light, ventilation, or sanitation facilities, or have other problems that make them unfit for living in.[164]

2.2 Data collection

For each city, the target was a sample of 3,000 currently married women ages 15-49 for a total target of 18,000 women across the six cities in the individual longitudinal surveys. All eligible women in the household were interviewed for the women's questionnaire, with a total of 17,643 women interviewed at baseline.[109] At endline, 14,043 women were successfully tracked and interviewed in the six cities for the final matched endline sample. The response rate was 83.6% for the women's survey and 95.4% for households.[148]

At each wave of the women's survey, the questionnaire covered a variety of topics, including background characteristics; reproduction, including a birth and pregnancy history calendar; sexual life and contraception; fertility preferences; and gender inequality. A series of questions on abortion and other pregnancy terminations were included in the endline survey pregnancy history calendar section.

CHAPTER 3. PAPER 1: AUTONOMY, COMMUNITY NORMS, AND ABORTION IN URBAN NORTH INDIA

3.1 Background

Despite the broad legality of abortion in India since 1971, morbidity and mortality from unsafe abortion continues to be a major public health concern.[10,15,126] The most recently available data estimate that between 8[7,8] and 11%[2] of the approximately 45,000 maternal deaths per year[9] in the country are due to unsafe abortion. With an estimated 3.2 million abortions occurring annually in the North Indian state of Uttar Pradesh (UP), a state characterized by high fertility and low female autonomy,[15,19,109,117] the need for safe and accessible services is high—but access is low, as 89% of abortions in the state occur outside facilities.[117] Substantial abortion stigma can make women reluctant to seek facility-based care, and reproductive healthcare facilities in UP are underfunded and often inaccessible, particularly for the urban poor.[10,117,146,165,166]

A facilitator to abortion access may be women's autonomy, which has been consistently linked to women's reproductive experiences and health.[36,37,49] Women's autonomy (also sometimes termed "agency") can be defined as the ability to define goals and act upon them.[35] An important distinction is the difference between defining a goal (autonomy) and being able to act upon it through control of resources (what has been termed "functional autonomy")—the difference between the theoretical ability to do something and actually doing it.[46] At a higher level, the related concept of empowerment incorporates the dynamic process through which people collectively gain power and resources to develop the ability to make their own strategic life choices when they were previously restricted from doing so.[35,46] Autonomy, on the other

hand, can be thought of as the extent that individual women exert control over their own lives within the context of the specific time and place in which they live.[46]

Literature typically distinguishes between several primary domains of autonomy, which overlap, are synergistic, and can influence each other, including: financial or economic autonomy; mobility or freedom of movement; decision-making ability (e.g., about healthcare for oneself or one's children, contraceptive use, or visiting friends or family); reproductive autonomy; and marital control.[35,36,42,43] An additional important distinction is between women's autonomy and women's status. Kabeer describes status as relating more to the values of the community, in that the collective assigns value to individual "choices," and persons who make those choices are then given greater value within the community; an example is the situation in which women's status is dependent on fertility and women with the "correct" sex and number of children will have higher status—though not necessarily more autonomy.[35] Thus, women may still have little control over their lives even in an environment in which their status is high.[44]

Generally, more autonomous and empowered women appear more likely to use contraception,[58-62] have lower fertility,[53,63-68] and have greater access to and use of maternal healthcare.[76,77,167] However, the relationship between specific domains of autonomy and reproductive outcomes is not always consistently in the same direction.[36,57] For example, current use of contraception appears to sometimes show positive relationships with autonomy, rarely negative associations, but most often, no relationship.[57] Similarly, most research addressing autonomy or empowerment and fertility intentions has found that higher levels of autonomy or empowerment translate into lower preferred family size, greater spousal communication around fertility, and a greater ability to make fertility decisions—but there is attenuation when

community effects are included and there are inconsistencies in significance and directionality by autonomy domain.[36,41,53,58,69-75]

Consequently, there may also be inconsistencies in the relationships between autonomy domains and abortion attainment. We might expect that women with low autonomy would be less able to access safe abortion services, leading to increased morbidity and mortality. Aspects of autonomy such as mobility and financial decision-making likely directly influence the ability to navigate access obstacles and obtain abortion services. Conversely, certain types of autonomy, such as reproductive autonomy or marital control may increase women's likelihood of using contraception and thus, they may not have unwanted pregnancies in the first place.

There is a lack of research on autonomy and abortion, especially that which attempts to disentangle the many ways in which autonomy may influence abortion and which includes measures of autonomous decision-making as opposed to solely structural status indicators like education or wealth.[36,168] Agrawal's [27] analysis of India's 1998-1999 National Family Health Survey-2 (NFHS-2) found that literacy and wealth, as well as an autonomy scale (including control of finances, decision-making, and mobility) were associated with having ever had an abortion. The gender composition and number of existing children was also a strong predictor of abortion; women with two children, with one of them a son, were more likely to have had an abortion, perhaps indicating use of abortion to achieve a small family, albeit one with a son.[27] Also using the NFHS-2, but with only women's status measures, Bose and Trent[29] found that literacy, caste, and higher standard of living were associated with experiences of abortion, particularly in North India; similarly, a dichotomous variable constructed to indicate son preference by assessment of women's ideal family gender composition was also strongly associated with experience of abortion. Similarly, using primarily indicators of women's status,

analysis of a survey from Rajasthan showed likelihood of abortion increased with older age, higher caste, and higher standard of living.[33] Taken together, these may suggest that although women with more autonomy or status by certain measures may be more likely to obtain abortions, the driver may also be ideal family composition or son preference (which is itself an indicator of structural gender norms) coupled with the access to contraception and abortion that money facilitates.

Alternatively, Paul's[86] qualitative study of young married women in Rajasthan found that abortion was used as a means for women to have reproductive autonomy within the confines of social norms. Fertility expectations meant that women were not able to openly use contraception, but when an unwanted pregnancy occurred, women used abortion to stay within the two-child norm—without regard to the fetus's sex and without apprising the mother-in-law of the pregnancy (and subsequent abortion). Analyses of a hybrid "narrative" quantitative survey in Madhya Pradesh[16] showed that more education, experience of domestic violence, gender composition of living children, and a combination of additional individual and household fertility preferences influenced women's likelihood of seeking an abortion.[37,38,84] Women's own fertility preferences had the strongest effect on the odds of attempting abortion, with their husband's preferences—particularly when the couple agreed that they do not want another child—influencing both abortion-seeking and the use of surgical abortion; in-laws' preferences had a weaker influence.[84]

Increasingly, there is evidence that, rather than individual autonomy, the broader context in which a woman lives, and the social scripts she is expected to follow, may be more important in accessing reproductive healthcare and health outcomes.[36,57,167] Women's lives are situated in and influenced by the people in their household, neighborhood, and larger communities, with

each having effects on how women experience the world.[154,159] Community-level factors such as inequitable gender norms, the proportion of educated women in the community, or community exposure to family planning messages have long been shown to have significant effects on individual reproductive behaviors and outcomes, including contraceptive use,[137-139] unintended pregnancy,[81] fertility,[140] and antenatal care and skilled birth attendance.[141] In India, community characteristics have been shown to influence both health behaviors, such as use of reproductive and maternal health services,[76,142] and health outcomes, such as pregnancy and delivery complications and achievement of desired fertility.[143] Specifically, community-level gender norms have been linked to contraceptive use.[41]

However, there is little research in India or elsewhere that has addressed abortion from a comprehensive, contextual perspective, including autonomy at the individual and community level's influence on abortion specifically in the urban context.[33,36,57] We know that women's living situations matter for predicting contraceptive use and other reproductive health outcomes in urban North India,[152] but less is known about how that living situation combines with other aspects of women's lives (individual characteristics and autonomy, community norms and characteristics) to exert influence on pregnancy outcomes. While a few studies have included some household or community variables and have expressed the importance of incorporating contextual influences, the results have been mixed and without consensus.[29,33,84] To our knowledge, there are no studies that address autonomy's effects on abortion-seeking with a contextual perspective that use a multilevel model to appropriately account for the multiple levels of influence. Though we would expect that autonomy would influence the ability to access abortion care, the scant research on this topic is inconclusive, cannot account for temporality between development of autonomy and later abortion, and does not address how individual

autonomy, gender relations in the household, and gender norms in the community combine to affect women's ability to obtain safe abortions.[10,16,27,29,33,36-38,84-87]

Accordingly, this study uses a multilevel framework to determine the relationships between women's autonomy, individual and community-level sociodemographic characteristics, and community gender norms and attainment of abortion in six cities of Uttar Pradesh, India. It is important to more fully understand the both the different levels at which autonomy works and the constellation of factors that facilitate and constrain access to safe abortion services in order to strategically develop interventions to improve safe abortion access and decrease abortion-related maternal morbidity and mortality.[5]

3.2 Methods

3.2.1 Data and sample

Data are from the Measurement, Learning & Evaluation (MLE) Project, which undertook the impact evaluation of the Urban Reproductive Health Initiative (URHI), a multi-country program funded by the Bill & Melinda Gates Foundation and implemented in India, Kenya, Senegal, and Nigeria. The Urban Health Initiative (UHI), as it was known in India, aimed to increase supply, demand for, and access to modern contraceptive use, with a particular focus on the urban poor.

Longitudinal data were collected from women in 2010 and 2014 in six cities (Agra, Aligarh, Allahabad, Gorakhpur, Moradabad, and Varanasi) in the state of Uttar Pradesh in North India. A multi-stage sampling design based on slum maps was used for the individual baseline survey in 2010. Primary sampling units (PSUs) of approximately 100 households each were selected at random for both slum and non-slum areas. Using systematic random sampling, 30 households in each PSU were selected for household and women's surveys. In this analysis, we

aggregate women by PSU to represent the local neighborhood and environment in which women live; past research has shown the aggregation and PSU approach to be an acceptable proxy for community.[41,137,169] The urban poor were over-sampled, with over half of the sample in each city living in slum areas; study weights for each city make the samples representative of the entire study cities.[109] See Nanda et al. 2011[109] for further details of the sampling frame and study design.

All married women aged 15-49 who were usual residents of the household or had stayed there the night before the interview were eligible and were interviewed using the women's questionnaire, with a total of 17,643 women interviewed at baseline in 2010.[109] Upon consenting to participate, women were interviewed by a female interviewer using a structured questionnaire; if more than one woman was interviewed in the household, women were interviewed separately. At endline in 2014, 14,043 women were successfully tracked and interviewed in the six cities.[148] The MLE study protocol was approved by the Institutional Review Boards of the University of North Carolina at Chapel Hill (UNC-CH), the International Center for Research on Women (ICRW), and MAMTA-Health Institute for Mother & Child (MAMTA-HIMC).

We used both the baseline and endline data to assess the effects of women's autonomy and their individual and community-level sociodemographic characteristics on abortion. From the matched baseline and endline sample, we excluded women who were non-fecund or sterilized at baseline (n=4,454), who did not have a pregnancy during the data collection period of August 2010 to July 2014 (n=6,009), and who were currently pregnant with their first pregnancy at endline data collection (n=117). Women with missing data for the covariates of interest (n=67) and women who did not know their caste (n=2) were excluded. Additionally, due to small cell sizes, women who answered "none" (n=37) or "don't know" (n=23) to a baseline

question on their preferences for the ideal gender composition of children were also excluded. Once these exclusion criteria were applied, women in PSUs with five or fewer women[170] were excluded (n=1,631) in order to allow for large enough cluster sizes for multilevel modeling. The final unweighted sample size was 1,703 married women aged 15-49.

3.2.2 Measures

Each wave of the women's survey covered a variety of topics, including background sociodemographic characteristics; reproduction, with a birth and pregnancy history calendar; sexual life and contraception; fertility preferences; and gender inequality. A series of questions on abortion, miscarriage, and stillbirth was included in the endline survey pregnancy history calendar section.

The outcome variable for this analysis is the binary variable *abortion experience between August 2010 and July 2014*. For women with more than one pregnancy since baseline, only the first pregnancy is included as the index event for analysis as it occurred closest to the collection of baseline sociodemographic and autonomy data. Women who reported at endline that their earliest pregnancy recorded during the pregnancy history calendar time period ended in abortion were coded as "1" and women who reported any other outcome to their earliest pregnancy were coded as "0."

Independent sociodemographic variables were categorized according to their level of influence and analysis (individual or community)[171] and measured at baseline to control for temporality. The primary independent variables of interest measure a woman's difference from her community's norm in several areas of autonomy: financial, mobility, marital control, and reproductive (Table 3.1). We use this construction of autonomy to capture the less-commonly investigated relational aspects of autonomy—how an individual relates and compares to their

community and the community norms around them—as an important indicator of women's ability to make choices free from (or despite) external control. The concept of deviance from community norms has been explored in health outcomes and programming, in that understanding more about women who deviate positively from the norm in their community may help identify models for improving the health of other women in the community; conversely, understanding more about women who deviate negatively from the norm can help identify characteristics and needs of women who may be particularly vulnerable.[172-174] We also include individual difference from the community median age at marital cohabitation[a] and from the community median number of years of education.

Financial autonomy, mobility, marital control, and reproductive autonomy were first constructed as individual scale variables by summing the individual scale items and standardizing them. All autonomy scales were scored so that a higher score indicates a higher degree of autonomy. Gender norms at the community level were measured by aggregate autonomy scale variables, created by constructing community means for each PSU that did not include the index woman (non-self means). Finally, to create the variable measuring an individual's difference from the community, we subtracted the community mean score from each individual's autonomy score to create a score indicating how far a respondent falls above or below her community's norm. A positive value for an individual's difference from the community variable indicates that a woman's score was higher than her community's norm (i.e., she was more autonomous than her community's norm), and a negative score indicates the

[a] In India, a marriage may be formalized before puberty, but cohabitation may not begin until after puberty and the *gauna* ceremony is performed. We use "marital cohabitation" to be clear that we are interested in and measuring the time that a couple has been living together as husband and wife and presumably in a sexual relationship.

opposite. We used the same process for age at marital cohabitation and years of education variable, but with medians instead of means.

For financial autonomy, two questions were included on whether the woman has money of her own that she alone can decide how to use (*yes*=1, *no*=0) and who decides how the money that her husband earns will be used (*respondent alone or joint*=1, *husband alone or someone else*=0). The mobility scale was comprised of eight items that asked if the woman was allowed to go alone (scored as "3"), with a child ("2"), only with another adult ("1"), or not at all ("0") to several locations in the same or different areas, including the health center when sick or pregnant, friends' or relatives' houses, markets, and religious events. Marital control was measured by four items asking whether the respondent's husband prohibits her from certain activities (working outside the home, having visits from people, visiting friends, visiting family), with no prohibitions coded as "1" and prohibitions or don't know coded as "0." In addition, a question asking who makes healthcare decisions for the respondent (*respondent alone or joint*=1; *husband or someone else*=0) was included in the marital autonomy scale. The reproductive autonomy scale included six questions on contraceptive decision-making: ever having discussed the number of children to have with her husband (*yes*=1, *no*=0); having initiated a conversation with her husband on the number of children to have in past six months (*yes*=1, *no*=0); whether there is perceived concordance between the respondent and her husband on the number of children to have (*same or wife wants more*=1, *husband wants more or don't know*=0); who decides how many children the respondent should have (*mostly respondent or joint* =1, *mostly husband or someone else*=0); ever having discussed contraception with her husband (*yes*=1, *no*=0); and who decides whether the respondent uses contraception (*mostly respondent or joint*=1, *mostly husband or someone else*=0).

We assessed a number of individual-level sociodemographic covariates that may be related to reproductive health and obtaining an abortion based on previous literature: age; age difference between husband and wife; woman's age at marital cohabitation; duration of marital cohabitation; woman's education in years; husband's education in years; education difference between husband and wife; woman's employment status; media exposure; gender composition of living children; gender composition preference; ever use of reversible contraception; current (at baseline) use of reversible contraception; ever had a previous pregnancy end in abortion, miscarriage, or stillbirth; household type; wealth; religion; and caste. At baseline, the pregnancy history calendar combined abortion, miscarriage, and stillbirth into one question ("Have you ever had a pregnancy that miscarried, was aborted or ended in a stillbirth?") to reduce underreporting and bias due to stigma. The household type variable records whether the respondent lives with her mother-in-law and whether she lives in her husband's natal home; it was constructed from the household survey, which inventoried all household members and their relationship to the head of household.

Community-level covariates included slum/non-slum residence, city, proportion of women in a PSU that are in the poorest wealth quintile, and majority religion in a PSU. We also included two additional community-level variables measuring other community gender norms. A scale assessing community norms of women's attitudes towards spousal violence was comprised of questions that asked respondents if a husband is justified in hitting his wife in seven situations: if she goes out without telling him, if she neglects the house or children, if she argues with him, if she refuses to have sex with him, if she doesn't cook the food properly, if he suspects her of being unfaithful, and if she shows disrespect to her in-laws. "No" answers were coded as "1" and "yes" or "don't know" was coded as "0." This scale was included only at the community level to

reflect community norms around violence rather than women's individual attitudes about violence. Finally, we were interested in whether the reproductive experiences of others might influence individual abortion-seeking. The proportion of women in a community who ever had a previous pregnancy end in abortion, miscarriage, or stillbirth was included, as measured in quartiles: 1) communities where <9% of women have had such a pregnancy, 2) communities where 9-16% of women had a pregnancy end in one of these outcomes, 3) communities where 17-25% of women had a pregnancy end in these outcomes, and 4) communities where >25% of women had a pregnancy end in abortion, miscarriage, or stillbirth. All community-level variables were created with the full survey sample (n=14,043) before the sub-sample exclusion criteria was applied.

3.2.3 Analysis

Given that there are multiple levels of influence that likely affect urban North Indian women's pregnancy outcomes and that the data are nested (the data indicates what communities women are part of), we used a multilevel logistic regression model that accounts for the theoretical structure and hierarchical data.[171,175] We used a two-level model (level 1=individual, level 2=community) in order to include the theorized important influencers of pregnancy outcomes for women in North India. While multiple women per household could be interviewed for the survey, most households only had one or two women, so there were not enough observations per household to include a household level random intercept in the multilevel analysis. However, variables that reflect the household's composition and characteristics were included in the analysis at the individual level. City of residence was included as a level 2 predictor, but could not be employed as an additional higher level for analysis as there were too few cities.[176]

Analysis was conducted in three phases. First, we reviewed frequencies for variables of interest and assessed multicollinearity. Several collinear variables (duration of marital cohabitation, woman's education, and husband's education) were removed at this stage. Second, we used planned backwards block stepwise regression[177,178] to build a multivariable logistic regression model to examine the individual-level predictors associated with abortion and reduce the number of variables in the multilevel model. Variables were grouped theoretically and reviewed for significance using Wald tests with the Bonferroni correction to account for the number of blocks. Blocks that were not significant were dropped (woman's employment status, educational difference between husband and wife, media exposure; age, age difference between husband and wife; and wealth, religion, caste), though we retained blocks with the most theoretically-important variables even if not significant.

Finally, we used a generalized linear latent and mixed model (GLLAMM), which allows for the multilevel nature of the data, non-normality, and complex survey data.[175,179,180] We weighted the data to account for the complex survey design and accounted for two levels of sampling and weights by dividing individual weights by the mean weight of the level 2 group.[179] We first assessed whether there was variation by community (PSU) using the linear threshold model/latent variable method for intraclass correlation (ICC)[180,181] and median odds ratio (MOR)[180-182] of the null (intercept-only) model. The MOR, which translates the area level variance into an odds ratio scale, was 1.83; this indicates that in the median case, if a woman moves to an area with a higher probability of obtaining an abortion, her risk of obtaining an abortion would (in median) increase 1.83 times. The ICC was 0.11, indicating that approximately 11% of the variation in individuals is due to variation at the community level.[171] Given that the ICC met the generally-recommended 10% threshold, the data are clustered, and the research

question addresses constructs working at multiple levels, we proceeded with the multilevel GLLAMM.[171,175]

Model 1 included only the individual difference from community norm autonomy variables in a random intercept with fixed coefficients model. Model 2 added the individual-level sociodemographic variables that were theoretically important or statistically significant in the initial multivariable logistic regressions. Model 3 added community-level variables and Model 4 added a cross-level interaction between community mean financial autonomy and individual difference from community mean financial autonomy. This cross-level interaction was chosen because financial independence and having money that one can control oneself has a clear, direct link to being able to access reproductive healthcare in places where the healthcare system is such that a large amount of care—and reproductive healthcare specifically—occurs in the private sector and without health insurance coverage, such as India (and especially in urban Uttar Pradesh).[15,19,147] We assessed model fit using likelihood ratio tests and Akaike information criterion (AIC), with lower values indicating better model fit. All analyses were conducted in Stata statistical analysis software (version 15.1)[183] using *svy* commands to account for the complex survey design and the user-written command *gllamm* for the multilevel models.[180]

3.3 Results

3.3.1 Descriptive characteristics of the sample

The 1703 women in the sample lived in 229 communities (PSUs) at baseline, with an average of 7.8 women per community (range: 6-14). Table 3.2 presents characteristics (weighted percentages and unweighted n's) of the sample. Between baseline and endline data collection, the earliest pregnancy-related event for 8.64% of women was an abortion, slightly higher than the most comparable data showing 5.1% of last pregnancies ending in abortion in Uttar

Pradesh.[147] At baseline, 14.50% of women had ever had a previous pregnancy end in abortion, miscarriage, or stillbirth. Sixty-two percent had never used contraception at baseline. While just over half (53.35%) of women desired to have an equal number of sons and daughters and 27.51% had no gender preference, at baseline, women most commonly had only daughters (26.03%), only sons (22.77%), or no living children (23.13%). Just over half (53.27%) lived in their husband's natal home without their mother-in-law present, and 27.51% lived in their husband's natal home with their mother-in-law. At baseline, 37.55% of women lived in a community where under nine percent of women had a pregnancy end in abortion, miscarriage, or stillbirth; only 15.34% of women lived in a community where more than 25% of women reported ever having a pregnancy end in an outcome other than a live birth.

Table 3.3 presents autonomy indicators at baseline: individual autonomy (not included in multivariable models but shown for comparison), community-level autonomy, and individual differences from community autonomy. At the individual level, women's mean marital and reproductive autonomies were somewhat higher than other types of autonomy: the means for mobility and financial autonomy were at or below the scale midpoints and the means for marital and reproductive autonomy were above the scale midpoints. The overall median age at marriage was 19 and the median years of education was 8. Compared to their communities, women had slightly higher than average reproductive autonomy and slightly lower than average mobility, financial, and marital autonomy scores.

3.3.2 Multilevel regression results

In the unadjusted model, individual difference from community norms for mobility (OR 1.25; CI 1.01,1.56) and individual difference from community median age at marriage (OR 0.92; CI 0.86,0.99) were associated with obtaining an abortion (Table 3.4). Women with more

mobility than the norm for their community were more likely to obtain an abortion, while women who were older than the median age in their community when they got married were slightly less likely to obtain an abortion. Adding the individual-level sociodemographic variables in Model 2 eliminated the autonomy variables' association with abortion, and only previous pregnancy ending in an outcome other than live birth (OR 2.33; CI 1.49,3.63) and having only daughters (OR 0.53; CI 0.29,0.99) as compared to an equal number of sons and daughters were significant. Adding the community-level variables in Model 3 retained the explanatory power only of previous pregnancy end and added several significant community-level variables—living in Moradabad, living in a slum area, and living in a community where 9-16% of women reported a prior pregnancy ending. Living in a slum community (OR 0.56; CI 0.36,0.87) or in the city of Moradabad (OR 0.33; CI 0.13,0.86) were associated with decreased odds of obtaining an abortion between baseline and endline**.** Women who lived in a community where 9-16% of women reported ever having a pregnancy end in abortion, miscarriage, or stillbirth were almost twice as likely to report an abortion between baseline and endline (OR 1.80; CI 1.07,3.03).

Model 4 added a cross-level interaction between community financial autonomy and individual difference from community financial autonomy. While neither community financial autonomy or individual difference from community financial autonomy were significant alone in the earlier models, the cross-level interaction was significant (OR 1.66; CI 1.08,2.55). This indicates that as both a woman's individual financial autonomy relative to her community *and* the overall financial autonomy of women in her community rises, she is then more likely to obtain an abortion. Other than the interactive effect, the same variables remained significant at approximately the same magnitude as in Model 3 and having only daughters was again associated with lower odds of abortion (OR 0.51;CI 0.27,0.97).

3.4 Discussion

On their own, none of the individual- or community-level autonomy variables that were hypothesized as related to abortion attainment showed significant results in the final adjusted model. However, several indicators of socioeconomic status, reflections of power in a family, and societal gender norms were related to obtaining an abortion: women who did not have any sons, who lived in slum communities, or who lived in the city of Moradabad were significantly less likely to obtain an abortion. Women who had an earlier pregnancy end in an abortion, miscarriage, or stillbirth were the most likely to obtain an abortion between baseline and endline. Finally, one form of autonomy—financial—did become a significant predictor of abortion attainment only when an interaction term operating at both the individual and community levels was included. As the financial autonomy of *all* women in a community rises *and* an individual woman's financial autonomy rises relative to her community, the likelihood of being able to obtain an abortion increases. This indicates the potential importance for reproductive health access of both one's own ability to obtain and spend money and the community norms around women's employment, access to, and control over money.

At the most basic level, the ability to determine how money is spent as a partial component of predicting abortion attainment makes logical sense. Most abortions in urban Uttar Pradesh take place outside of the public sector, at either a private facility or through purchasing medication abortion tablets at a pharmacy.[117] At a median cost of 4,000 Indian rupees ($60) in 2015 for a surgical abortion and 700 rupees ($11) for a medication abortion (plus indirect costs such as transportation or other medications), a woman who wants an abortion must come up with a substantial amount of money relatively quickly.[184,185] There are several ways in which women might access funds for an abortion: she might have income or savings that she controls, either

alone, or with a husband who supports her in getting an abortion; she might not have very much money, but controls access to it herself or has a supportive husband and can come up with enough money for an abortion; she might have no control over how any money she or her husband earns is spent, but her husband wants her to get an abortion; or she might have other familial or social supports that she can draw upon.[186] Money earned by and controlled by a woman has generally been shown to be more likely to be spent on her own healthcare needs, including reproductive healthcare.[167] This would suggest the presence of at least some functional autonomy in the financial arena, as it is difficult to obtain an abortion without actually gathering money (as opposed to only the theoretical ability to control decision-making around money). However, it will be important to better disentangle income from autonomy in the future to more clearly understand whether it is the level of income alone, who controls spending money, or a combination of the two that enables women to obtain an abortion.

For women in India, especially young or recently-married women living in their husband's household with restricted mobility, neighborhoods can provide women with their primary source of relationships outside their husband's family and can be influential.[187,188] However, the cross-level interaction results indicated that it may be not only what women in the surrounding community are doing or one's individual ability to spend money, but a combination of the two that may make a difference in the ability to actually obtain an abortion. This invites comparison to the literature on positive deviance, or the idea that some individuals may have exceptional practices or behaviors that consequently lead them to better outcomes than their neighbors who share similar risks.[172] In this case, deviance from the norm in the financial arena at both the individual and community levels (e.g., women who had greater ability to control more resources than other women *and* lived in communities where the norms around women's control

of financial resources were already more supportive than average) may be the catalyst propelling women to obtain an abortion precisely because abortion requires the ability to gather money quickly. For example, research with similar conceptualizations of the individual's positive deviance from community norms has shown that women in Bangladesh who positively deviate from community norms on attitudes about spousal violence are more likely to use facility-based delivery care.[174] Public health programs that identify positive deviance and support the spread of such behaviors have been shown to improve healthcare management, children's nutritional status, and other community health and organizational outcomes.[172,189,190]

Relatedly, having had a previous pregnancy end in abortion, miscarriage, or stillbirth prior to baseline data collection was the strongest predictor of an abortion after baseline. This may suggest that these women preferred abortion over contraception for controlling their fertility, or alternatively that they lacked access to contraception; they may also have experienced pressure from others to abort. Additionally, once a woman has experienced the ending of one pregnancy, familiarity with the process may reduce some barriers to being able to end a subsequent pregnancy. Essentially, ending a prior pregnancy might prove—to herself and perhaps also to others—a woman's ability to have reproductive autonomy, thus making her more likely to have and use that autonomy in the future, even if she cannot avoid pregnancy in the first place. Research in other contexts has suggested that history of abortion attempts may increase likelihood of later abortion,[191] that women with previous abortion (but not miscarriage or stillbirth) experience are more likely to terminate a pregnancy with serious fetal anomalies than women with no previous abortions,[192] and that women with two or more previous miscarriages are more likely to have had more than one abortion as compared to one abortion.[193] In the Indian context, it may be that a history of prior abortion indicates that women (or their families) are

using abortion to obtain the gender composition of children that they want or that they simply lack access to contraception and are using abortion as their primary method of family planning. Interestingly, it was only women in the second quartile—those who live in communities where 9-16% of women reported a prior pregnancy ending in miscarriage, stillbirth, or abortion—who were more likely to have an abortion by endline; for women in the communities where a larger proportion of women (more than 16% of women) reported an abortion or fetal death, there was no association with abortion attainment. However, the relationship between previous pregnancy ending and abortion attainment (or the potential for this relationship) in this study should not be overstated: whether one's neighbors have had an abortion or fetal death is different from *knowing* whether one's neighbors had an abortion or fetal death. Women often keep abortions secret, even in the tight quarters of an urban slum where information and gossip may spread quickly among neighbors. Given that women may not know about the abortions of their neighbors, this variable may be picking up other general community effects relating to access to service, such as the community's proximity to pharmacies. Additionally, the baseline variable includes miscarriage and stillbirth along with induced abortion, while the endline variable is able to disaggregate abortion. We cannot be sure exactly which event, or events (abortion or miscarriage or stillbirth, or more than one), occurred prior to baseline data collection and how contraceptive choice may be related, so the implications of this connection cannot be further disentangled.

Perhaps the least surprising result of this study was that having only daughters was associated with a decreased likelihood of obtaining an abortion. Significant previous research, particularly in North India, has shown preferences for sons and an ideally-composed family of two sons and one daughter to play a role in fertility intentions, use of contraception, and

abortion-seeking.[27,29,103,147,194,195] This study reflects previous research findings on gender composition of living children, though not on gender composition preference; this suggests there may be a distinction in this data and population between survey items measuring something concrete (gender of living children) vs. those measuring fertility intentions, which are difficult to quantify and may fluctuate.

3.4.1 Study strengths and limitations

This study is not without limitations. First, there is potential for selection bias. The most autonomous women also may have been the most likely to use contraception to control their fertility, and thus may never have gotten pregnant in the first place (and would have been removed from our sample). Attempts to account for this by using a selection model and by using a multinomial regression model that included multiple pregnancy outcomes (wanted live birth, unwanted live birth, miscarriage/stillbirth, abortion) were not successful due to variable and sample size constraints. Therefore, the results of this study apply only to women who experienced a pregnancy, not to all women.

As in many studies on abortion, social desirability bias may have reduced reporting of abortions, although the proportion of abortions reported out of all pregnancies in this sample over four years (6.28%) is similar to the most recent NFHS data for the proportion of abortions out of all pregnancies over the last five years in UP (5.10%) and the proportion of women reporting ever having a pregnancy end in abortion, miscarriage, or stillbirth in this sample (14.39%) is also similar to that for UP in the NFHS (16.90%) (though of course the NFHS is also potentially subject to underreporting).[147] Any underreporting may vary by women's characteristics, as certain characteristics—specifically, individual autonomy levels—may make some women more or less likely to reveal stigmatized health information.

The baseline data was collected between February and August 2010, but the pregnancy history calendar asked women to recall reproductive experiences back to January 2009. In addition to the potential for recall bias, it is also possible that the overlapping timeline may mean that some women's characteristics as recorded at baseline were not exactly what they were at the time of a slightly earlier abortion. However, most sociodemographic characteristics of interest are unlikely to substantially change over a short period of time, and the UHI, with its focus on contraceptive demand generation, had not yet been implemented to potentially influence contraceptive use.

In the regression models, we were not able to use the household as a level of analysis in the multilevel model because there were not enough women per household to do so; given that the household is a source of influence over women's autonomy and choices, this may reduce the general validity of our model. We use PSU to approximate a community in the multilevel modeling; while significant previous research[41,137,169] has applied the same technique, it is also possible that a PSU is not equal to a community in urban areas. Relatedly, a significant number of respondents had to be dropped from the analytic sample because they lived in PSUs with too few women to reliably conduct multilevel modeling, which may have caused additional selection bias. Further qualitative and ethnographic research to describe neighborhoods and community networks in urban India is likely needed. It is also possible that the direction of causality is reversed and it is actually experience of abortion or other reproductive events that influences women's levels of autonomy or empowerment;[37,38,46] given the longitudinal nature of this data, future research could investigate this.

However, a combination of data structure and analytical modeling choices allows this study some distinctive strengths. The longitudinal nature of this data may have mitigated social

desirability bias to an extent, as women may have become more comfortable over time through multiple visits by female interviewers conducted in private locations. The use of baseline autonomy and sociodemographic measures and endline pregnancy outcome measures reduces problems with temporality and the potential for reverse causation. Multilevel modeling accounts for the different influences on women's pregnancy outcomes, reflecting the real-world environment in which individual women are nested within families and communities. Moreover, with a minimal amount of information known about abortion in urban India, this study provides a much-needed description of how sociodemographic characteristics and autonomy might influence abortion attainment in urban North India.

3.5 Conclusion

Our findings highlight the potential importance of community norms and how an individual's deviation from those norms may influence abortion-seeking. It may be that it is not only an individual woman's lived experience and current circumstances that influence whether she seeks and obtains an abortion, but how that lived experience interacts with the world in which she exists. The significance of the cross-level financial autonomy interaction that incorporated both overall community norms and women's individual difference from community norms indicates that health and development programs should not focus only on community-level economic growth and empowerment or on smaller-scale initiatives aimed at individual women, such as microcredit programs. Support for programs that address financial equity and empowerment on a larger scale, such as financial literacy, mobile banking, and universal basic income initiatives, and for initiatives that focus on and support individuals more intensely (such as savings and loan groups or microcredit programs with regular, long-term small-group involvement) is needed to improve women's ability to financially access safe abortion services.

At the same time, a focus on women's financial empowerment is not the only solution, given that abortion services are so disproportionately provided only in the private sector, forcing women to pay significant sums for a medical procedure that they should, in theory and in law, be able to access in the public sector. Increased support for training, certification, and the indirect costs of abortion provision in the public sector would help reduce the need for women to make extreme financial maneuvers in order to afford a safe abortion. Finally, drawing from community-involved positive deviance approaches to acknowledge, develop understanding of, and learn from women's experiences within and outside of community norms may lead to new ideas to improve both contraception and safe abortion access.

3.6 Tables

Table 3.1. Individual autonomy and community gender norms scale variable constructions

Measure	Variables included in scale
Financial autonomy	Whether the respondent has money of her own that she alone can decide how to use
	Who decides how money that husband earns will be used
Mobility	*Whether the respondent can go alone, with a child, with another adult, or not at all to:*
	…the health center when she is pregnant
	…the health center when she is sick
	…a friend's or relative's house in the same area, within a 5-10 mile walk
	…a friend's or relative's house in a different neighborhood
	…a market in the same neighborhood
	…a market in a different neighborhood
	…a religious event in the same neighborhood
	…a religious event in a different neighborhood
Marital autonomy	Who usually makes decisions about health care for the respondent
	Whether the respondent's husband prohibits her from:
	…working outside the home
	…having visits from people
	…visiting friends
	…visiting family
Reproductive autonomy	*Whether the respondent:*
	…has ever discussed with husband the number of children to have
	…and her husband want the same number of children
	…her husband, both, or someone else decide how many children to have
	…has ever discussed family planning with the husband
	…has initiated a conversation about family planning with her husband in the past 6 months
	…her husband, or both make the decision to use family planning
Spousal violence attitudes	*Whether the respondent believes a husband is justified in hitting or beating his wife if:*
	…she goes out without telling him?
	…she neglects the house or the children?
	…she argues with him?
	…she refuses to have sex with him?
	…she doesn't cook the food properly?
	…he suspects her of being unfaithful?
	…she shows disrespect for her in-laws?

Note: All scales scored so that a higher score indicates more autonomy

Table 3.2. Descriptive characteristics of the sample (unweighted n=1703)

	Weighted %	Unweighted n
Earliest pregnancy event between baseline and endline was abortion		
No	91.36	1,576
Yes	8.64	127
Baseline characteristics		
Age		
15-19	8.99	164
20-24	39.75	695
25-29	33.57	543
30-34	14.46	232
35-39	2.72	58
40+	0.52	11
Age difference between husband and wife		
Wife is older, same age, or <5 years difference	59.25	1,030
Husband is 5-9 years older	33.95	567
Husband is 10+ years older	6.80	106
Education		
No education	35.85	663
1-5 years completed	9.29	210
6-8 years completed	14.17	249
9-12 years completed	24.28	376
13+ years completed	16.41	205
Current use of reversible contraception		
No	74.26	1,296
Yes	25.74	407
Ever used reversible contraception		
No	61.57	1,043
Yes	38.43	660
Ever had a previous pregnancy end in abortion, miscarriage, or stillbirth		
No	85.50	1,417
Yes	14.50	286
Gender composition of living children		
Equal number of sons and daughters	11.94	218
More sons than daughters	6.61	111
Only sons	22.77	403
More daughters than sons	9.53	171
Only daughters	26.03	427
No living children	23.13	373
Ideal gender composition of children		

Equal number of sons and daughters	53.35	907
More sons than daughters	17.35	307
More daughters than sons	1.79	32
No preference	27.51	457
Household type		
Not natal home and no mother-in-law	17.71	254
Lives in husband's natal home only	53.27	938
Lives with mother-in-law only	1.51	24
Lives in husband's natal home with mother-in-law	27.51	487
Slum residence		
Non-slum	77.41	753
Slum	22.59	950
Wealth quintile		
Poorest	23.01	457
Poor	22.07	398
Middle	19.52	316
Rich	21.83	343
Richest	13.57	189
Majority religion in community		
Majority Muslim	36.13	665
Equal Hindu/Muslim or majority Hindu	63.87	1,038
Community proportion ever had a previous pregnancy end in abortion, miscarriage, or stillbirth, in quartiles		
Quartile 1, <9% of women had a pregnancy end	37.55	504
Quartile 2, 9-16% had a pregnancy end	28.42	411
Quartile 3, 17-25% had a pregnancy end	18.69	377
Quartile 4, >25% had a pregnancy end	15.34	411

Table 3.3. Autonomy and community norms indicators at baseline

Individual[a]	Mean	SD	Range
Financial autonomy	1.12	0.76	0-2
Mobility autonomy	10.91	4.81	0-24
Marital autonomy	3.91	1.16	0-5
Reproductive autonomy	4.87	1.10	0-6
	Median		Range
Age at marital cohabitation	19.00		1.00-35.00
Years of education (women)	8.00		0.00-20.00
Community-level[b]	Mean	SD	Range
Mean financial autonomy in community	-0.14	0.51	-1.34-0.92
Mean mobility autonomy in community	-0.14	0.39	-0.93-1.49
Mean marital autonomy in community	-0.14	0.54	-2.23-0.80
Mean reproductive autonomy in community	-0.03	0.52	-1.70-0.973
Mean attitude towards spousal violence in community	-0.19	0.68	-2.17-0.59
	Median		Range
Median age at marital cohabitation	18.00		16-22.5
Median years of education (women)	5.00		0-15
Individual differences from community[b]	Mean	SD	Range
Mean financial autonomy	-0.27	1.07	-2.93-2.16
Mean mobility autonomy	-0.35	0.89	-2.64-2.55
Mean marital autonomy	-0.14	1.07	-3.83-2.49
Mean reproductive autonomy	0.11	1.02	-4.52-2.60
Median age at marital cohabitation	1.13	3.16	-17.50-17.00
Median years of education (women)	1.74	6.11	-15.00-20.00

[a]Individual autonomy scale variables are non-standardized

[b]Scale variables created using standardized individual scale variables

Table 3.4. Generalized linear latent and mixed logistic regression models for abortion outcome with 95% confidence intervals (n=1703)

	Model 1 (unadjusted)		Model 2 (individual-level)		Model 3 (community-level)		Model 4 (interaction)	
Individual characteristics	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI
Individual differences from community autonomy:								
Mean financial autonomy	1.11	0.91,1.34	1.02	0.83,1.25	1.07	0.87,1.30	1.15	0.92,1.45
Mean mobility autonomy	1.25*	1.01,1.56	1.07	0.84,1.36	1.11	0.85,1.46	1.11	0.85,1.46
Mean marital autonomy	0.91	0.73,1.13	0.88	0.70,1.10	0.88	0.71,1.10	0.89	0.71,1.10
Mean reproductive autonomy	1.23	1.00,1.52	1.13	0.91,1.40	1.13	0.88,1.44	1.12	0.87,1.44
Median age at marital cohabitation	0.92*	0.86,0.99	0.94	0.88,1.01	0.93	0.86,1.01	0.93	0.86,1.01
Median years of education (women)	1.02	0.99,1.06	1.02	0.98,1.06	1.02	0.98,1.07	1.02	0.98,1.07
Current use of reversible contraception			1.38	0.77,2.49	1.39	0.77,2.50	1.4	0.78,2.52
Ever used reversible contraception			1.47	0.81,2.68	1.59	0.89,2.84	1.54	0.85,2.76
Ever had a previous pregnancy end in abortion, miscarriage, or stillbirth			2.33***	1.49,3.63	2.20***	1.42,3.40	2.14***	1.37,3.33
Gender composition of living children (ref.: equal sons and daughters)								
More sons than daughters			1.99	0.96,4.13	1.91	0.89,4.11	1.9	0.87,4.11
Only sons			1.09	0.58,2.05	1.15	0.60,2.19	1.13	0.59,2.15
More daughters than sons			1.48	0.82,2.65	1.32	0.75,2.33	1.29	0.73,2.28
Only daughters			0.53*	0.29,0.99	0.53	0.28,1.00	0.51*	0.27,0.97
No living children			0.55	0.25,1.18	0.57	0.26,1.27	0.56	0.25,1.23
Ideal gender composition of children (ref.: equal number of sons and daughters)								
More sons than daughters			0.82	0.49,1.38	0.87	0.52,1.47	0.86	0.51,1.46
More daughters than sons			1.28	0.42,3.91	1.45	0.52,4.03	1.53	0.55,4.26
No preference			1.24	0.76,2.01	1.12	0.70,1.79	1.11	0.69,1.79
Household type (ref.: not natal home and no mother-in-law)								
Lives in husband's natal home only			1.17	0.68,2.00	1.36	0.78,2.36	1.38	0.79,2.41
Lives with mother-in-law only			2.67	0.60,11.84	1.94	0.53,7.05	1.94	0.54,6.96
Lives in husband's natal home with mother-in-law			0.9	0.48,1.67	1.07	0.56,2.04	1.11	0.58,2.13
Community-level characteristics								
City (ref.: Agra)								
Aligarh					1.37	0.72,2.61	1.36	0.71,2.59
Allahabad					0.99	0.44,2.23	0.96	0.42,2.17
Gorakhpur					1.23	0.61,2.50	1.26	0.63,2.53
Moradabad					0.33*	0.13,0.86	0.32*	0.12,0.83

Varanasi					0.47	0.20,1.11	0.47	0.20,1.10
Slum residence					0.56*	0.36,0.87	0.55**	0.35,0.86
Proportion of women in the poorest wealth quintile					0.6	0.13,2.66	0.59	0.13,2.64
Community is equal Hindu/Muslim or majority Hindu					1.47	0.93,2.34	1.47	0.93,2.33
Mean financial autonomy					1.07	0.63,1.82	1.17	0.67,2.04
Mean mobility					1.18	0.65,2.14	1.17	0.64,2.14
Mean marital control					1.07	0.63,1.83	1.08	0.63,1.84
Mean reproductive autonomy					0.95	0.57,1.60	0.95	0.57,1.60
Median age at marital cohabitation					0.85	0.63,1.15	0.84	0.62,1.14
Median years of education (women)					0.98	0.90,1.06	0.98	0.90,1.06
Mean of women's attitudes towards spousal violence					1.17	0.74,1.84	1.18	0.75,1.85
Proportion of women in a community who ever had a previous pregnancy end in abortion, miscarriage, or stillbirth, in quartiles (ref.: quartile 1, woman lives in a community where <9% of women have had a pregnancy end)								
Quartile 2, lives in a community where 9-16% had a pregnancy end					1.80*	1.07,3.03	1.79*	1.06,3.00
Quartile 3, lives in a community where 17-25% had a pregnancy end					0.9	0.46,1.76	0.92	0.47,1.81
Quartile 4, lives in a community where >25% had a pregnancy end					1.08	0.57,2.05	1.09	0.58,2.07
Interaction								
Financial autonomy: individual difference from community mean x community mean							1.66*	1.08,2.55
Community-level variance (SE)	0.38	-(0.22)	0.41	-(0.24)	0.00	(0.00)	0.00	(0.00)
Log-likelihood	-450.36		-422.76		-400.42		-398.00	
Akaike information criteria (AIC)	916.73		889.52		880.84		877.99	

* p < 0.05, ** p < 0.01, *** p < 0.001

CHAPTER 4. PAPER 2: SELF-MANAGED ABORTION IN URBAN NORTH INDIA

4.1 Introduction

Medication abortion (MA)—the termination of pregnancy using the drugs mifepristone and misoprostol or solely misoprostol—has the potential to enhance women's privacy and autonomy, as MA can be controlled by the woman herself and the abortion process can take place outside of a facility. It is increasingly common throughout the world.[196,197] Evidence suggests that MA is acceptable to women and often preferred to surgical abortion because women find it more convenient and confidential, less invasive, and prefer the reduced time spent at facilities.[197-199] Commonly, women first visit a facility to obtain an MA, but when protocols allow and when offered the choice, many women choose to ingest the medication at home,[200,201] reporting enhanced privacy and control with home administration.[198,201,202] Increasingly, some women are choosing to manage the entire medication abortion process without clinician involvement and outside the facility context (i.e., a self-managed abortion, SMA), particularly where access to abortion is limited or significant abortion stigma exists.

An SMA may include visiting a pharmacy or lower-level drugstore (but not a higher-level facility or facility-based medical provider), obtaining MA drugs and/or information through hotlines or websites, or procuring abortifacients through other informal means.[203] In an SMA, which may also be described as self-induction, self-abortion, self-termination, or self-use, the woman procures the means of abortion, self-induces, and manages the process without a licensed medical provider being present or comprehensively involved. With the increased availability of

medication abortion, SMA is now usually a medication abortion, but could also be ingestion of herbs, other drugs, abdominal trauma, or instrumentation by oneself or a person who is not a regular, licensed clinical provider.[204] The terms "self-management" or "home management" are also sometimes be used to describe situations in which women visit a doctor, are prescribed MA drugs, and ingest the drugs at home, with the abortion then occurring at home; however, in line with the current language conventions around this topic, we consider self-management to be when the woman manages the full process herself without input from any clinician other than perhaps a pharmacist who sells her the drugs.[203] The ability to have an abortion at home (including when the entire process is not self-managed) has been shown to increase women's perceptions of autonomy, privacy, and satisfaction with the abortion process without differences in effectiveness.[198,200-202,205,206] Thus, it may be that in situations where women already distrust the formal medical system or fear social consequences if their abortion is known, women may choose SMA for increased privacy and the ability to be more autonomous.[121] While there is little research on safety and effectiveness of SMA specifically, existing evidence does suggest that women can safely and effectively manage their own abortions,[204,207-209] and the World Health Organization (WHO) recommends self-management in some circumstances if the woman has "accurate information and access to a health-care provider should they need or want it at any stage of the process."[210] The WHO also recently moved the mifepristone – misoprostol drug combination for medication abortion from the complementary list to the core list of the WHO Model List of Essential Medicines (meaning that it is the most efficacious, safe, and cost-effective medicine and that all healthcare systems should have it available) and removed a note that mifepristone – misoprostol requires "close medical supervision," based on evidence presented that close medical supervision is not required for safe and effective use.[211,212]

In India, provision of any type of abortion is legally restricted to licensed doctors in registered facilities,[114] but in practice, somewhere between one-quarter and three-quarters of all abortions are estimated to occur outside of facilities, primarily through medication purchased at a pharmacy or drugstore.[19,115] Pharmacists in India are not legally allowed to dispense MA drugs without a prescription from an accredited abortion provider.[116] Yet in practice, MA from pharmacists without a prescription is widely available;[117,118] women commonly visit pharmacies and drugstores when initially seeking abortion care and to purchase MA drugs.[10,112,119,120] Pharmacies outnumber and are more accessible than formal healthcare facilities—especially in urban areas—and in contexts where women are able to purchase MA drugs directly at a pharmacy, SMA also has potential to decrease the time, cost, and exposure of accessing care.[118,119,121] Indeed, as pharmacists and drugstore workers have varied knowledge of and expertise in MA regimens, policies and programs in India and South Asia more broadly have targeted pharmacist education as a strategy to expand access to safe abortion and decrease maternal morbidity and mortality.[118,119,122-125]

The ability to access abortion through pharmacies without extensive involvement of the formal healthcare system may be particularly important to women in the Indian state of Uttar Pradesh (UP), which is characterized by high rates of unwanted pregnancies, low female autonomy, and underfunded and inaccessible reproductive healthcare facilities, particularly for the urban poor.[15,19,109,117,146] Approximately 3.2 million abortions occur each year in UP.[117] Yet, only about 11.4% of abortions take place in facilities; the state, while the most populous in India, has the lowest number of registered abortion clinics per capita in the country and less than one-fifth of public facilities offer abortion services.[117] Guttmacher's 2015 study estimates that 83.4% of all abortions in the state are medication abortions occurring outside a facility,[117] and in the

2015-2016 National Family Health Survey (NFHS-4), 39.4% of urban women in UP who had an abortion reported that they performed their last abortion themselves,[147] a significantly larger proportion than for urban women in India overall (22.9%).[19]

Moreover, UP is characterized by significant socioeconomic inequities that can make facility-based abortion difficult to obtain.[19,117,147] Cost and transportation problems can constrain women from getting to a facility, but women attending a facility also may be turned away because of the staff's limited capacity, lack of training, incorrect understanding of the legality of abortion in different situations, and staff and providers' own biases and stigmas.[10,14,15,109,117] The lack of public sector facilities providing abortion disproportionately affects the poorest women, for whom the lowest-level public facilities are often the only point of health care delivery.[10,110] Familial and community social norms also stigmatize contraception and abortion,[19,117,147] even while the preference for an ideally-composed family of two sons and one daughter conversely appears to influence abortion-seeking throughout the country and in UP specifically.[29,103] In some circumstances, abortion may be obtained through direct intervention from pronatalist family members who first restrict access to contraception, but then facilitate termination due to son preference.[10,99]

Where access to abortion is constrained women often use their communities and existing networks of family and friends to gain information about abortion in general, providers, or self-management.[186,213-218] Several studies throughout India show that women more often receive information about abortion from their networks of family and friends than from healthcare workers, and women who receive information on abortion from family or friends are more likely to seek termination of a pregnancy compared to women who receive information on abortion from healthcare workers.[13,26,33,120] Additionally, while social and communication networks are

embedded in any community environment, they may be particularly tight in North Indian urban slums owing to the shared, thin walls in slum housing, and connected communal washing areas.[188] Women also often spend more time with neighbors in urban areas than in rural areas, where nuclear families are larger and extended families, as opposed to neighbors, exert tighter control.[187,188]

Longstanding research has established the links between social relationships and health and health-seeking behavior, including the importance of the number of ties to others that one has; the closeness, quality, and behavior of those ties; interaction with non-family members; and the access to resources that a social network can bring.[219-221] It is also clear that, along with individual characteristics, larger structural and systemic forces in hierarchal societies influence those social ties differentially.[219,220] Applied to SMA, this could mean that knowing others in one's personal network who have self-induced makes one more likely to self-induce or that perceiving that others in the community are supportive of self-abortion makes one more likely to self-induce, and that caste or other socioeconomic realities also affect the structure of social relationships and how they influence behavior.[213,220]

Despite such a large proportion of abortions taking place with limited or no involvement from clinicians, there is little in-depth research on SMAs in UP or India as a whole.[199] Other than brief mentions in the recent large-scale abortion incidence study reports[115,117] and NFHS-4,[147] and one recent qualitative study on pathways to MA,[120] most existing studies that address SMA in India are small observational analyses of women seeking facility care for complications[222-225] or draw conclusions connecting SMAs to morbidity and mortality even in the absence of data linking the two.[25] Study designs that do not include women who self-induce at home and never need follow-up care bias results away from uneventful SMAs that do not result in

complications.[199] Given that the vast majority of medication abortions are completed safely and effectively[226] and most SMAs currently are by medication, there are likely to be a substantial number of SMAs that are completed quite safely but about which we know very little.

There are a number of outstanding questions about SMA that are worth exploring. Are women who self-induce autonomously choosing an SMA because they prefer to control the process and the environment in which they abort, or are they alternatively resorting to self-termination because they cannot access the facility-based care that they would prefer or do not have support from their husbands or in-laws in making reproductive health decisions? What are social relationships like for women who self-induce, and what type of communication do they have with people outside their families? What other sociodemographic characteristics might make women more or less likely to self-manage an abortion? It is important to understand more about the women using SMA and the circumstances around SMAs in urban Indian communities where information spreads through social networks quickly and stigma around family planning can be high and influential in women's management of unwanted pregnancies.[117,203] Given that the majority of abortions in UP and India as a whole may be occurring outside facilities, with different contexts and risks than facility-based abortions, understanding more about SMAs will allow for the creation of specific, targeted interventions to ensure the largest possible number of abortions occur safely. To that end, this study describes women's experiences with SMAs in urban UP, examining associations between SMA and sociodemographic characteristics, autonomy and community gender norms, and other characteristics of the abortion.

4.2 Methodology

4.2.1 Study design and sample

Between 2010 and 2014, the Measurement, Learning & Evaluation (MLE) Project at the University of North Carolina at Chapel Hill (UNC-CH) undertook an impact evaluation of the Bill & Melinda Gates Foundation-funded Urban Reproductive Initiative (UHI) in six cities (Agra, Aligarh, Allahabad, Gorakhpur, Moradabad, and Varanasi) in UP in North India. The project focused on improving access to contraceptives and reproductive health care among Northern India's urban poor. Longitudinal data were collected from women in 2010 (baseline) and 2014 (endline). Primary sampling units (PSUs) of approximately 100 households each were randomly selected and 30 households per PSU were systematically randomly sampled for household and women's surveys, with slum areas oversampled.[109] All married women aged 15-49 in selected households were interviewed by a female interviewer with a structured questionnaire and pregnancy history calendar. At baseline, 17,643 women were interviewed, and 14,043 (88.9%) were successfully tracked and interviewed at endline.[148] The MLE study protocol was approved by the Institutional Review Boards of UNC-CH, the International Center for Research on Women (ICRW), and MAMTA-Health Institute for Mother & Child (MAMTA-HIMC).

For this analysis, which focused on women who reported an induced abortion between 2009 and 2014, we used the matched baseline and endline sample. We excluded women who were infecund or sterilized at baseline (n=4,454), did not report an induced abortion between January 2009 and July 2014 (n=9,261), or were missing data on variables of interest (n=16); due to small cell sizes, we also excluded two women who answered "none" to a baseline question on

their ideal gender composition of children. The final unweighted sample size is 310 married women aged 15-49.

4.2.2 Outcome variable

Women who reported an abortion were asked a series of follow-up questions on the most recent abortion, including who "performed" the abortion and where. We classified abortions as being self-managed if the respondent reported that she herself, a family member, relative, or friend performed the abortion, or if she went to a pharmacy or drugstore as the only location of care for the abortion. Abortions were not considered self-managed if the respondent reported a doctor or nurse performed the abortion, including if the woman reported that she did not go to a facility for the abortion but saw a doctor or nurse. While currently only doctors practicing at a registered facility are allowed to provide abortions in India,[12] there are proposed changes to the Medical Termination of Pregnancy (MTP) Act that would allow nurse provision[227] and there have been task-shifting projects in which nurses provided medical and surgical abortions with outcomes comparable to physicians.[228,229] Given the widespread availability of medication abortion in pharmacies as well,[117,118] we therefore considered abortions performed by a nurse as closer to those performed by a doctor than to a self-managed abortion.

4.2.3 Independent variables

In the analysis, we considered selected sociodemographic characteristics, autonomy, community gender norms, and social networks and communication variables. Variables were chosen based on previous literature on abortion in India in general[10,15,115,117,230,231] and the limited extant literature covering SMA in South Asia[25,117,124,125,199,222-225,232,233] and worldwide.[207,208,214-216,234-240]

To permit appropriate analysis with a small sample size, only sociodemographic variables that were associated with SMA in previous research and/or selected closely-related variables were included; categories for some variables were further collapsed due to small cell sizes. In South Asia, age,[222,225,232] education,[223,232] socioeconomic status,[225] and parity[225] appear to be related to SMA in observational, hospital-based studies. Elsewhere, age,[235,236,238] education,[238] and socioeconomic status[214,235,239,240] have been associated with SMA. Thus, we included age, education, gender composition of living children, gender composition of children preference, wealth quintile, and slum residence, all measured at baseline.

Studies in a number of countries have suggested the importance of social networks and access to information in women's abortion decision-making and management in general[186,216,218,241] and specific to SMA.[208,214,215] Variables that reflect the respondent's social contacts and networks included employment status (respondent does not work or works for family; respondent works for herself or non-family); whether the mother-in-law lives in the household; and whether the respondent reported ever discussing family planning with her natal family members, her in-laws, a neighbor, or a friend. Access to communication and media was measured by whether the respondent reported access to a mobile phone and the level of exposure to different media sources (*none*; *medium*=reads newspapers/magazines, listens to the radio, or watches television; *high*=reads newspapers/magazines and listens to the radio or watches television).

Similarly, based on existing literature on SMA[202,214,234,238] and abortion in general,[186,242,243] we included measures of autonomy and community norms at baseline. These included variables assessing community gender norms and variables assessing a woman's difference from her community's norms in several areas: financial, mobility, marital, and

reproductive autonomies. The individual survey items included in each scale are described in more detail in Table 4.1 and elsewhere.[244] To create the community gender norms variables, we aggregated women by PSU to represent the neighborhood and environment in which women live; past research has shown this approach to be an acceptable proxy for community.[41,137,169] The individual difference from community norms variables allowed us to include the less-commonly investigated relational aspects of autonomy as an indicator of women's ability to make choices free from (or despite) external pressure. This captures the concept of positive and negative deviance from community norms, which has been targeted as an indicator of health outcomes, a potential way to identify promising models for improving the health of others in the community (by understanding more about those who deviate positively from the norm), and a way of understanding the needs of the especially vulnerable (by understanding more about those who deviate negatively from the community norm).[172-174]

To create the autonomy variables, we first summed the individual items in each scale (ranging from two items in the financial autonomy scale to eight items in the mobility scale) and z-standardized the scores to produce individual autonomy scores for each type of autonomy; all were scored so that a higher score indicates a higher degree of autonomy. Then we created community means for each PSU that did not include the index woman (non-self means). Finally, to create the individual difference from community mean variables, we subtracted the community mean score from each individual's score to produce a score indicating how far the respondent falls above or below her community's norm. A positive value indicates that a woman's score was higher than her community's norm (i.e., she was more autonomous than her community's norm), and a negative score indicates the converse. The same process was used for

age at marital cohabitation[b] and education, with medians instead of means. We also included a scale assessing women's attitudes towards spousal violence, measured at the aggregate community level only because the scale items only assessed attitudes about the acceptability of spousal violence, not direct experience with spousal violence. Additionally, we included two variables assessing women's perception of whether family planning is stigmatized in the community *("Are there some people in your community who will call you bad names or shun your company if they knew that you were using a modern family planning method?"*), measured categorically at the individual level (response options: *yes, no, I don't know*) and aggregated to the community level by calculating the mean proportion of women in a PSU who believe family planning is not stigmatized.

We also assessed characteristics of the abortion, including method (surgical or medication), trimester of pregnancy, whether the respondent had spoken with a community health worker (CHW) before the abortion, location of abortion, reported reason for the abortion, and side effects. The survey did not directly ask women the method of their last abortion, but women were asked whether they had ever used MA *("Have you ever taken an abortion pill after a missed period to stop a pregnancy (Misprost, Khushi, or Safe Abort Kit)?"*) and when they used it. Using this question with the pregnancy history calendar and interview date, we were able to determine whether MA was used for the last abortion.

[b] Marriage may be formalized before puberty in India, but the couple may not begin living together until after (the woman's) puberty and the *gauna* ceremony is performed. We use "age at marital cohabitation" instead of "age at marriage" to more clearly indicate the time that a couple has been living together as husband and wife and presumably in a sexual relationship.

4.2.4 Statistical analyses

We present frequency distributions and measures of central tendency overall and by abortion experience (SMA or abortion managed by a nurse or doctor) for each group of variables (women's characteristics, social networks and communication, and autonomy and community gender norms), as well as for characteristics of the abortion. For the women's characteristics, social networks, and autonomy variable groups, we calculated chi-square tests and t-tests for categorical and normally-distributed continuous variables by abortion experience. We first computed bivariate logistic regressions for each independent variable of interest (women's characteristics, social networks and communication, and autonomy and community gender norms) on abortion experience. Due to the large number of potential autonomy variables, only those with significant associations with SMA in the bivariate regression analyses were included in the final multivariable model. For abortion characteristics (trimester, reasons, etc.), we calculated chi-square tests by abortion experience. All analyses were conducted in Stata statistical analysis software (version 15.1)[183] using *svy* commands to account for the complex survey design.

4.3 Results

4.3.1 Descriptive characteristics of the sample by type of abortion experience

As the numbers are small, differences in the women's characteristics, social networks, and communication variables by abortion type were not statistically significant in chi-square and t-tests and bivariate regressions. Among women in UP who reported abortions between 2009 and 2014, 16.15% (n=55) of abortions were reported as self-managed. Women who had an SMA were more commonly younger (15-24) or older (35-49) than women who had an abortion managed by a doctor or nurse (Table 4.2). Women who had SMAs had slightly lower levels of

education than women with non-SMAs. Greater percentages of women who saw a doctor or nurse for their abortion had no children (12.31%) or only sons (29.15%) compared to women with SMAs (4.75% and 18.46%, respectively). Overall, a greater percentage of women whose abortion was performed by a doctor or nurse had ever discussed family planning with anyone (natal family members, in-laws, neighbors, friends) than women who had an SMA (Table 4.3). More women who had an SMA worked for non-family or for themselves (15.79%), as compared to 8.77% of women who saw a nurse or doctor.

Community gender norms indicated higher autonomy in the communities where women with SMAs lived, as compared to communities where women who did not have SMAs lived, except for reproductive autonomy (Table 4.4). In bivariate regressions, women living in communities with higher levels of financial autonomy, marital autonomy, and more people who believed that family planning is not locally stigmatized were more likely to report a self-managed abortion. Yet women who self-managed their abortion reported slightly less of each type of autonomy compared to their communities' norms than women whose abortions were managed by a provider, though the only statistically significant differences were individual difference from median age at marriage and individual difference from community reproductive autonomy. While the median age at marriage was 18 for both groups, women who self-terminated were right at the median, whereas women who went to a facility were one year older than the median for their communities. A larger proportion of women with SMAs believed that family planning is not stigmatized in their community (63.03%) than women with provider-led abortions (44.35%).

4.3.2 Descriptive characteristics of abortions by type of abortion experience

About one-third (32.13%) of all abortions were medication abortions, and the remaining two-thirds (67.87%) were surgical (Table 4.5). Notably, self-managed abortions all took place in the first trimester and tended to be medical abortions: three-quarters (75.40%) of women with an SMA used medication, whereas three-quarters of women who saw a doctor or nurse (76.20%) had a surgical abortion. Over three-quarters of women did not speak with a CHW before obtaining the abortion (SMA: 77.28%; non-SMA: 77.35%). Of women categorized as having a self-managed abortion, the majority (75.94%) reported that they themselves performed the abortion, 17.66% reported that a family member or friend performed the abortion, and 6.40% reported that a pharmacist or drugstore worker was the provider. The reasons that women cited for their abortions were similar across abortion experiences, except that more women with a provider-led abortion reported concerns about the risk of birth defects (SMA: 2.11%; non-SMA: 15.40%). Just over one-quarter (25.06%) of women who had an SMA reported any side effects, as compared to 55.08% of women with a provider-led abortion. Among women who self-terminated, the main side effects reported were pain (22.77%), vomiting (18.22%), and infection (14.49%). Among women who had a provider-assisted abortion, the percentage reporting pain (48.54%) or infection (30.06%) was higher. Significantly more women who saw a provider reported excessive bleeding (36.50%) as compared to women with an SMA (10.06%).

4.3.3 Regression analysis

In the model with only sociodemographic characteristics, women with 13 or more years of education (odds ratio, 0.25) and women with no living children (0.12) were significantly less likely to have an SMA (Table 4.6). When social networks, communication, autonomy, and community gender norms variables were added to the model, several additional variables were

also significantly associated with SMA and women without living children were no longer significantly less likely to have an SMA. Women who only had sons were less likely to have an SMA (0.21) as compared to women with an equal number of daughters and sons. Women who were aged 25-34 were less likely than younger women aged 15-24 to have an SMA as compared to a provider-led abortion. The only significant autonomy or social network variable was community mean financial autonomy. The average level of financial autonomy in a community was related to type of abortion experience: for each additional point in average community financial autonomy, women living in that community were over three times more likely to have an SMA than a provider-led abortion (3.29).

4.4 Discussion

This analysis indicates that, in many ways, much of the context of women's lives and abortion experiences is not markedly different between women whose abortion is performed by a medical provider or by women themselves. While women with SMAs were less likely to be aged 25-34, to only have sons, or have 13 or more years of education, there were no differences in abortion type by education, wealth, social networks, and communication access in the regression analysis. Similarly, descriptive characteristics of abortion experiences showed that the reasons that women cited for their abortions were mostly analogous regardless of the type of abortion.

In the regression analysis, communities in which women had more financial autonomy at baseline were also more likely to have women who self-managed their abortions. This may suggest that women in those communities—who had more income of their own to spend as well as more of a say in how their husbands' income was spent—were using some autonomy over finances to choose the method of abortion that felt most comfortable to them. In general, money earned by women themselves is more likely to be spent on healthcare.[167] For some women, their

preferred method of family planning may be purchasing medication abortion drugs from a nearby pharmacy or drugstore to take at home. Especially in urban slums or rural areas, facilities offering abortion services may not be proximate or well-regarded, and women may not feel that their reproductive healthcare choices are respected or kept private.[10,15,109,117] Providers in this context routinely restrict women's access to contraception,[245] so it plausible that women might assume that providers would also restrict their access to abortion. On the other hand, the association between more education and facility-based abortion may indicate that once women reach the high status implied by having substantial education, they may make a different choice—facility-based abortion. This suggests that autonomy in finances and status due to education may have differential effects on abortion experience.

Additionally, comfort with an abortion experience can include affordability.[134,202] The cost-benefit analysis that women make when they are able to choose what type of abortion to have likely incorporates the balance between price and other aspects of comfort, such as location, privacy, or type of provider.[186] The average cost of medication abortion purchased at a pharmacy in India is significantly lower than either medication or surgical abortion at a facility,[118,120] and for some women, that may be the deciding factor that helps them feel comfortable moving forward with one method over another. The difference between an assumed one-time cost for an abortion and the recurring cost of contraception may also play a role in the decision to use SMA. Conversely, the descriptive results showing that women with SMAs actually had less autonomy in many areas than their higher-than-average communities' norms and the lack of significance of individual-level financial autonomy could instead suggest that these women in fact had less choice in abortion type and that SMA was not their preferred method. SMA may not have been an active choice, but may instead represent a lack of choice and access to care.[246]

Taken together, other significant regression results that were associated with being less likely to have an SMA—middle age range of 25-34 and having only sons—also appear to reflect common gender norms in India in which sons are prioritized and women are expected to have their first child soon after marriage.[19,247,248] It may also indicate other household members' involvement in women's reproductive health. Most likely, women who self-manage their abortions fall into one of two categories: women who do not see any provider before self-inducing, or women who visit a facility for confirmation of pregnancy (and perhaps an ultrasound) and then decide to self-induce. Women in the latter category may have ultrasound confirmation of the fetus' gender; if they already have sons, they may have more support from their husbands and in-laws in terminating a pregnancy that falls too close to a previous birth, and thus be able to obtain a facility abortion.[10,86,99]

There are several limitations to this study. First, social desirability bias likely reduced women's comfort in reporting abortions; underreporting may also vary by autonomy, potentially influencing the likelihood of revealing stigmatized health information. Accordingly, the sample size for this analysis is small and limits the inferential analyses that are possible. The proportion of abortions out of all pregnancies in the full MLE sample over four years (6.45%) is similar to the most recent NFHS data for the proportion of abortions out of all pregnancies over five years in UP (5.10%)[147] but significantly lower than the 2015 Guttmacher estimates for UP (31.4%).[15] In addition, the UHI and MLE Project was not designed to focus in depth on abortion or assess self-managed abortion. Thus, there are a few instances in which the exact circumstances of women's abortions are somewhat unclear, which may have affected the analysis. Several women who reported that they did not see a doctor or nurse for their abortion also reported that they went to a hospital or clinic (n=4). Of these, two were surgical and two were medication

abortions. Because these women reported that no doctor or nurse facilitated their abortion, and there were no other concerns with conflicts in their data, we kept them in the SMA group. Similarly, nine women reported that their abortion was performed by a doctor or nurse but they did not visit a facility; three were reported as MA and six as surgical abortions. We included these abortions as non-SMAs because of the presence of a doctor or nurse, but it is difficult to know the exact situation. Both of these groups reflect the grey areas that can be present with SMA and abortion in places where it is legal but not accessible, whereby all or part of the abortion process may occur outside the formal healthcare system, while at the same time, could be facilitated by a skilled provider (and vice versa).

No follow-up questions were asked of women who reported an SMA, so it is unknown whether women preferred SMAs or resorted to them. Future research should further investigate this question, especially in relation to autonomy and empowerment. Finally, regression results should be interpreted with caution, as some confidence intervals were large, possibly indicating collinearity or reflecting the small sample size. Nevertheless, to our knowledge, this is the first paper to use representative systematically sampled data to investigate self-managed abortion in India. Other methodological features—including the use of longitudinal data and the use of baseline data on women's characteristics with endline data on abortions—strengthen this exploratory evidence on SMA in India.

While mobile phone access was not associated with one type of abortion experience over another, almost three-quarters of women in this sample did have access to a phone at baseline data collection in 2010. Telemedicine and mobile phone-based follow-up systems for self-managed or partially self-managed abortion care have been implemented in small-scale projects in South Asia and elsewhere to reduce the time and cost burden of abortion on women.[249,250]

While fewer women than men own mobile phones in India,[251] it appears that mobile coverage overall is continuing to grow[252] and the gender gap in mobile internet usage is actually decreasing with improved affordability.[253] Given that many women in India and around the world already appear to be managing their own abortions quite safely, text message-based programs, apps, and hotlines may provide additional mechanisms for providing women with information and connections to care for self-managed medication abortion.[119,203,249] Further investigation of possible structures and best practices for this in India is warranted; this includes ensuring that women are not excluded from their preferred type of abortion care—including self-managed abortion—because of lack of phone ownership and that it does not contribute further to imbalances in mobile access by gender, empowerment, and socioeconomic status.[251]

The effects of social networks and relationships are increasingly being incorporated in behavior-based public health interventions to understand community spread of information and behavior and to target individuals who may be most influential in affecting others' health.[254,255] This approach may be particularly useful for interventions addressing SMA and safe abortion, specifically meaning interventions that focus on improving women's ability to safely self-manage their own abortions, not only interventions aimed at increasing the proportion of facility abortions. The "accompaniment" and similar models that have been used in other contexts take advantage of relationships that already exist among women to build new networks to support women in self-management while subverting the traditional power dynamics and hierarchies present in healthcare systems and societies.[199,246] In this way, the burden of procuring a safe abortion is taken off the individual and spread to the collective. This can be particularly meaningful when the same power dynamics and hierarchies that influence women's experiences in healthcare facilities also restrict women's access to contraception and abortion in the first

place. Additionally, as previous research has found that men are frequently the purchasers of MA drugs,[238,256] choosing pharmacies where they already knew and trusted the pharmacist,[120] and that pharmacists are more willing to sell MA drugs without a prescription to people they already knew personally,[256] engaging networks of men, pharmacists, and drug sellers may help ensure correct dosage and follow-up care information disperses throughout communities. The finding that higher average community financial autonomy was significantly associated with SMA may reflect this consumer aspect of and private sector involvement in procurement of medication for SMA; given the high coverage of pharmacies and expanding private sector in India as well, further focus on improvements in pharmacy distribution of MA drugs is sensible. While there have been concerns that increased access to MA drugs through pharmacies could increase men's and in-laws' control over reproduction,[202] at the same time, pilots of pharmacy distribution with increased pharmacist education also appear to offer women safe and effective abortion with high levels of satisfaction.[122-125] Future research could also perhaps use the associated household survey to delve deeper into dyadic household connections between husbands and wives and the relationship to pharmacy purchases of MA drugs.

The findings of this exploratory study highlight the complexity of abortion access in urban UP and the multitude of ways in which women may experience abortion in contexts where it is theoretically legal but often inaccessible in practice. We see women making a choice—or having a choice made for them—that runs counter to what might seem to be the safest, most autonomous, or optimal choice, yet these women appear to be quite similar to or, in terms of side effects, even better off than women who had a different abortion experience. Resources, such as money, education, or social relationships, are key in enabling autonomous decision-making;[35,186] in this case, the more money that women in a community had available to them, the more likely

they were to have chosen a self-managed abortion, indicating that self-managed abortion was perhaps women's preferred choice of abortion experience. All people should have access to the method of abortion of their choice—including the choice of SMA—and the safest methods of abortion, and this study adds to evidence that self-managed abortion's safety can be comparable to facility-based abortion. As such, drawing from existing influential networks, such as those in urban slums where women, their partners, and their neighbors are in physical and relational proximity, could provide new structures to promote safe abortion wherever it occurs.

4.5 Tables

Table 4.1. Individual autonomy and community gender norms scale variable constructions

Measure	Variables included in scale
Financial autonomy	Whether the respondent has money of her own that she alone can decide how to use
	Who decides how money that husband earns will be used
Mobility	*Whether the respondent can go alone, with a child, with another adult, or not at all to:*
	…the health center when she is pregnant
	…the health center when she is sick
	…a friend's or relative's house in the same area, within a 5-10 mile walk
	…a friend's or relative's house in a different neighborhood
	…a market in the same neighborhood
	…a market in a different neighborhood
	…a religious event in the same neighborhood
	…a religious event in a different neighborhood
Marital autonomy	Who usually makes decisions about health care for the respondent
	Whether the respondent's husband prohibits her from:
	…working outside the home
	…having visits from people
	…visiting friends
	…visiting family
Reproductive autonomy	*Whether the respondent:*
	…has ever discussed with husband the number of children to have
	…and her husband want the same number of children
	…her husband, both, or someone else decide how many children to have
	…has ever discussed family planning with the husband
	…has initiated a conversation about family planning with her husband in the past 6 months
	…her husband, or both make the decision to use family planning
Spousal violence attitudes	*Whether the respondent believes a husband is justified in hitting or beating his wife if:*
	…she goes out without telling him?
	…she neglects the house or the children?
	…she argues with him?
	…she refuses to have sex with him?
	…she doesn't cook the food properly?
	…he suspects her of being unfaithful?
	…she shows disrespect for her in-laws?

Note: All scales scored so that a higher score indicates more autonomy

Table 4.2. Women's characteristics at baseline, overall and by abortion experience

	All abortions (n=310)		Self-managed abortion (n=55)		Abortion performed by doctor or nurse (n=255)	
	Weighted %	Unweighted n	Weighted %	Unweighted n	Weighted %	Unweighted n
Age						
15-24	32.50	108	35.00	20	32.02	88
25-34	59.28	173	49.89	28	61.08	145
35-49	8.23	29	15.12	7	6.90	22
Education						
No education	32.66	94	39.81	22	31.28	72
1-5 years completed	9.94	37	13.77	6	9.20	31
6-8 years completed	13.62	48	10.25	6	14.27	42
9-12 years completed	26.46	84	27.63	17	26.24	67
13+ years completed	17.31	47	8.55	4	19.00	43
Gender composition of living children						
Equal number of sons and daughters	19.40	56	29.34	14	17.49	42
More sons than daughters	10.65	33	13.32	9	10.14	24
Only sons	27.42	85	18.46	10	29.15	75
More daughters than sons	13.68	43	20.35	10	12.39	33
Only daughters	17.75	60	13.80	10	18.51	50
No living children	11.09	33	4.75	2	12.31	31
Ideal gender composition of children						
Equal or more daughters	54.91	170	62.84	31	53.38	139
More sons than daughters	15.20	47	17.12	12	14.83	35
No preference	29.89	93	20.04	12	31.79	81
Wealth quintile						
Poorest	22.83	63	20.10	10	23.36	53
Poor	21.84	73	25.24	18	21.18	55
Middle	23.66	70	20.81	10	24.21	60
Rich	18.75	63	21.61	12	18.20	51
Richest	12.91	41	12.24	5	13.04	36
Slum residence						
Non-slum	82.54	161	84.79	30	82.10	131
Slum	17.46	149	15.21	25	17.90	124

Table 4.3. Social networks and communication at baseline, overall and by abortion experience

	All abortions (n=310)		Self-managed abortion (n=55)		Abortion performed by doctor or nurse (n=255)	
	Weighted %	Unweighted n	Weighted %	Unweighted n	Weighted %	Unweighted n
Media exposure						
None	8.04	35	11.33	10	7.40	25
Medium	58.05	185	57.71	33	58.11	152
High	33.91	90	30.96	12	34.48	78
Has access to mobile phone						
No	29.09	87	34.07	15	28.13	72
Yes	70.91	223	65.93	40	71.87	183
Employment status						
Does not work or works for family	90.09	281	84.21	49	91.23	232
Works for someone else or self	9.91	29	15.79	6	8.77	23
Mother-in-law in the household						
No	74.96	229	76.18	40	74.73	189
Yes	25.04	81	23.82	15	25.27	66
Ever discussed family planning with:						
Any natal family members	7.48	18	1.71	1	8.59	17
Any in-laws	25.12	72	18.97	12	26.30	60
A neighbor	18.52	62	14.27	6	19.34	56
A friend	22.23	73	17.36	9	23.17	64

Table 4.4. Autonomy and community gender norms at baseline, overall and by abortion experience

	All abortions (n=310)		Self-managed abortion (n=55)		Abortion performed by doctor or nurse (n=255)		
Community gender norms[a, b]	Mean	SD	Mean	SD	Mean	SD	
Mean financial autonomy in community	-0.08	0.49	0.11	0.43	-0.12	0.49	**
Mean mobility in community	-0.05	0.37	0.03	0.41	-0.07	0.36	
Mean marital autonomy in community	-0.05	0.49	0.09	0.34	-0.08	0.51	*
Mean reproductive autonomy in community	-0.04	0.47	-0.13	0.52	-0.03	0.46	
Mean of women's attitudes towards spousal violence in community	0.00	0.49	0.08	0.43	-0.02	0.50	
Mean proportion with perception that family planning is not stigmatized	0.47	0.22	0.57	0.21	0.45	0.22	**
	Median	Range	Median	Range	Median	Range	
Median age at marital cohabitation in community	18.00	15.50-23.00	18.00	16.00-22.00	18.00	15.50-23.00	
Median years of education in community	6.00	0.00-17.00	6.00	0.00-12.50	6.00	0.00-17.00	
Individual differences from community[a]	Mean	SD	Mean	SD	Mean	SD	
Mean financial autonomy	-0.10	0.88	-0.24	1.05	-0.07	0.85	
Mean mobility autonomy	-0.23	0.85	-0.19	0.85	-0.24	0.85	
Mean marital autonomy	-0.12	0.92	-0.31	0.85	-0.08	0.93	
Mean reproductive autonomy	0.22	0.82	0.52	0.82	0.16	0.81	*
Median age at marital cohabitation	0.93	2.91	0.00	2.25	1.11	2.97	**
Median years of education	1.28	5.65	1.18	5.72	1.31	5.64	
Perception that family planning is stigmatized in the community	Weighted %	Unweighted n	Weighted %	Unweighted n	Weighted %	Unweighted n	
Yes	13.22	38	4.92	5	14.82	33	
No	47.37	152	63.03	32	44.35	120	*
Don't know	39.42	120	32.05	18	40.83	102	

[a]Scale variables were created using standardized individual scales
[b]Non-self means/medians
Bivariate regression significance * p < 0.05, ** p < 0.01, *** p < 0.001

Table 4.5. Abortion characteristics, overall and by abortion experience

	All abortions (n=310)		Self-managed abortion (n=55)		Abortion performed by doctor or nurse (n=255)		
	Weighted %	Unweighted n	Weighted %	Unweighted n	Weighted %	Unweighted n	
Method of abortion							***
Surgical	67.87	212	24.60	11	76.20	201	
Medication	32.13	98	75.40	44	23.80	54	
Trimester of pregnancy							
First	92.93	290	100.00	55	91.56	235	
Second	7.07	20	0.00	0	8.44	20	
Who performed abortion/source of abortion							
Doctor	59.35	181	--	--	70.78	181	
Nurse	24.50	74	--	--	29.22	74	
Pharmacist/drugstore worker	1.03	6	6.40	6	--	--	
Family member/relative/friend	2.85	11	17.66	11	--	--	
Self	12.26	38	75.94	38	--	--	
Location of abortion							***
Hospital/clinic	82.97	250	13.58	4	96.33	246	
Home/pharmacy/drugstore	17.03	60	86.42	51	3.67	9	
Spoke with a CHW before the abortion	22.66	74	22.72	9	22.65	65	
Reason for abortion:							
Delay or space childbearing	47.79	148	57.17	30	45.98	118	
Woman's health	17.67	55	12.84	8	18.61	47	
Risk of birth defect	13.25	46	2.11	1	15.40	45	*
Not ready for a child	12.63	32	8.27	6	13.46	26	
No money to take care of a child	2.69	11	5.93	4	2.07	7	
Side effects:							
Any side effect	50.24	148	25.06	12	55.08	136	*
Pain	44.38	130	22.77	10	48.54	120	*
Excessive bleeding	32.23	93	10.06	7	36.50	86	**
Infection	27.55	74	14.49	5	30.06	69	
Vomiting	19.16	56	18.22	8	19.34	48	
Injury	2.02	7	1.00	1	2.21	6	
Other side effect(s)	5.03	14	3.50	2	5.33	12	

Chi-square test significance * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 4.6. Multivariate logistic regression models for self-managed abortion with 95% confidence intervals (n=310)

	Model 1 (sociodemographic variables)		Model 2 (adds social networks, autonomy, norms)	
	OR	95% CI	OR	95% CI
Age (ref.: 15-24)				
25-34	0.37	0.14,1.01	0.31*	0.11,0.88
35-49	0.9	0.26,3.13	0.82	0.22,3.09
Education (ref.: No education)				
1-5 years completed	0.85	0.29,2.46	0.54	0.14,2.11
6-8 years completed	0.46	0.13,1.68	0.52	0.12,2.29
9-12 years completed	0.73	0.27,2.02	0.73	0.22,2.46
13+ years completed	0.25*	0.07,0.92	0.094*	0.01,0.70
Gender composition of living children (ref.: equal number of sons and daughters)				
More sons than daughters	0.55	0.13,2.37	0.69	0.12,3.97
Only sons	0.3	0.09,1.04	0.21*	0.06,0.79
More daughters than sons	0.69	0.20,2.31	0.57	0.13,2.51
Only daughters	0.34	0.10,1.19	0.26	0.06,1.10
No living children	0.12*	0.02,0.93	0.12	0.01,1.03
Ideal gender composition of children (ref.: equal or more daughters)				
More sons than daughters	1.12	0.34,3.64	1.06	0.31,3.67
No gender preference	0.73	0.30,1.75	0.53	0.21,1.33
Wealth quintile (ref.: poorest)				
Poor	1.11	0.36,3.45	1.65	0.36,7.50
Middle	0.84	0.22,3.12	1.35	0.22,8.42
Rich	1.72	0.49,6.08	2.07	0.31,13.90
Richest	2.95	0.75,11.60	5.74	0.55,60.10
Lives in a slum community	0.73	0.33,1.60	0.75	0.32,1.72
Media exposure (ref.: none)				
Medium			0.83	0.21,3.37
High			1.17	0.20,6.72
Has access to a mobile phone			0.33	0.09,1.26
Works for non-family member or self-employed			2.03	0.36,11.50
Has ever talked about family planning with:				
Anyone in her natal family			0.38	0.04,3.48
Any in-laws			1.6	0.57,4.44
A neighbor			0.66	0.23,1.90
A friend			1.47	0.58,3.74
Mother-in-law lives in the household			2.09	0.77,5.68
Perception that family planning is stigmatized in the community (ref.: yes)				

No	2.35	0.66,8.31
Don't know	1.22	0.26,5.65
Community mean perception that family planning is not stigmatized	3.02	0.51,17.99
Community mean financial autonomy	3.29*	1.09,9.96
Community mean marital autonomy	1.94	0.81,4.67
Difference in years from community median age at marital cohabitation	0.99	0.86,1.14

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

CHAPTER 5. CONCLUSION

This dissertation investigated how autonomy at the individual level, community-level gender norms, and other sociodemographic factors are associated with abortion-related health behaviors and experiences among married women in six cities in Uttar Pradesh, India. Specifically, the first paper examined the multilevel associations between community gender norms, individual deviance from community norms, and abortion attainment, focusing on several areas of autonomy (financial, mobility, marital control, and reproductive autonomy). The second paper concentrated on a specific form of abortion, self-managed abortion. It described women's experiences with self-managed abortion and examined the relationships between self-termination and sociodemographic characteristics, autonomy and community gender norms, and social networks and communication.

5.1 Summary of findings

The first paper found a cross-level interaction indicating that the likelihood of abortion rises as both a woman's individual financial autonomy in comparison to her community *and* the financial autonomy of women around her rises. No other autonomy or community gender norm variables were significantly associated with attainment of abortion. However, several related indicators of socioeconomic status or power in the family or community were related to obtaining an abortion. Women who did not have any sons, women who lived in slum communities, and women who lived in Moradabad (a city with more socioeconomic inequities than the other study cities) were significantly less likely to obtain an abortion by endline.

The second paper found that a substantial proportion (16.15%) of women who had abortions managed the abortion themselves, without involvement of a medical provider other than, in some cases, a pharmacist. Three-quarters of the self-managed abortions were medication abortions and almost three-quarters did not report any side effects or complications after the abortion. Women with the most education were more likely to choose facility-based abortion. Again, financial autonomy was related to abortion experience: women in communities with more overall financial autonomy were more likely to report self-termination.

Taken together, the results from this study reflect the potential for the community's influence on individuals' healthcare-seeking behavior and reinforce the idea that one needs resources—e.g., access to money and the ability to spend it, education—at one's disposal to truly be able to have agency and bodily autonomy. The more monetary control that women in a community had, the more likely they were to obtain an abortion and to use SMA. Women's higher financial autonomy in communities where there was more SMA may suggest that these women—who had more income of their own and more control over their husbands' income—were actively choosing to spend their money on SMA instead of facility-based abortion. Conversely, it may simply reflect the relative ease with which people can purchase medication abortion drugs in India.

5.2 Implications for interventions

5.2.1 Autonomy and empowerment programs

The first study in particular highlights the interrelationships between community norms and individual attitudes and health-seeking behavior. As in the socio-ecological model,[154,155] we see that individual characteristics are only one piece of the complex environment and system in which people live. Whether an individual falls within or outside of the gender norms for their

community, and the influences of that community, are important in health and health-seeking behavior, particularly for reproductive health and abortion. It may be that not only an individual woman's lived experience and sociodemographic context influence attainment of abortion, but how that lived experience interacts with the world in which she exists.

Therefore, it is important that health and development programs not only focus on large-scale community- or societal-level economic growth and empowerment or on smaller-scale initiatives aimed at improving individual women's economic situations, such as microcredit programs. Support for programs that address financial equity and empowerment on a larger scale, such as financial literacy, mobile banking, and universal basic income initiatives, and for initiatives that focus on and support individuals more intensely, is needed to improve women's ability to financially access contraception, safe abortion services, and other reproductive healthcare. However, it remains unclear whether women's employment and control over money may actually backfire and increase gender-based violence in places where women's economic empowerment is rare or seen as transgressive.[257-260] Therefore, it is imperative that women's empowerment or economic equity programs (aimed at any level) pay close attention to ensure ethical implementation and that unintended consequences are mitigated.

5.2.2 Abortion in general and facility-based abortion

Abortion services in India are disproportionately provided in the private sector, forcing women to pay significant sums for a medical procedure that they should, in theory and in law, be able to access in the public sector, which may lead women to more affordable options such as self-managed abortion or unsafe providers. Therefore, it is important to continue to broadly support expansion of safe abortion services in India, particularly for the urban poor. Increased support for training, allowing lower level providers to offer abortions, certification, and the

indirect costs of abortion provision in the public sector would help reduce the need for women to pay more for services than they should in order to afford a safe abortion or utilize unsafe providers. One simulation study found that improving access to safe abortion and postabortion care for three-quarters of women seeking abortion could prevent 22-50% of abortion-related deaths in India—and would save the health system significantly more money overall than focusing on contraception alone.[261] While abortion is legal in India under many circumstances, women (and sometimes providers) don't often know this or know the circumstances under which they can obtain an abortion; innovative information and communication campaigns that take advantage of the growing mobile phone and internet capability in the country may help spread information about the legal situation and logistical process of abortion.

5.2.3 Self-managed abortion

On the other hand, self-managed medication abortion is already widely used safely, increasingly acknowledged as acceptable, and recommended for use in some circumstances.[204,207-210] Making accurate information and reliable resources for SMA available is a particularly important equity issue for the poorest and most marginalized women, who may be at highest risk of unsafe abortion if they do not have the resources or information to access safer options. Some of the more innovative programs targeting reduction of maternal morbidity and mortality around the world use mobile technology to provide information on dosage, counseling, and "virtual accompaniment" through the self-managed medication abortion process.[209,262,263] A program testing text-message-based support and follow-up after medication abortion in South Africa has also shown that women are able to use texts to complete a self-assessment to confirm that the abortion is complete and report reductions in anxiety, particularly around side effects.[264,265] This may be an option for an increasing number of women in India. However, given the low literacy

and mobile and internet connectivity for many women,[251] especially the urban poor, additional venues for provision of information will be required.

Women's groups in India, and the social relationships and capital that they can bring with them, could be another format for provision of safe dosing information and other support. Self-management may be more discreet than facility-based abortion, which likely appeals to women in crowded urban neighborhoods where information and stigma spread quickly. As such, drawing from existing networks, such as those in urban slums where women, their partners, and their neighbors are in physical and relational proximity, could provide new structures to promote safe abortion wherever it occurs. Particularly where women's groups also function as microlending or savings groups, including information and support to women on both safe abortion services and financial literacy could target multiple objectives at the same time. Relatedly, "accompaniment" models, whereby peers support—rather than provide—other women during a self-managed abortion[246] could have the potential to be expanded to India. These programs support not only self-managed abortion, but also autonomy and empowerment in their explicit attention to people's rights in decision-making about their own bodies, as well as acting on those rights.[246,266]

Finally, several programs in India and South Asia more broadly have already targeted pharmacist education as a strategy to expand access to safe abortion and decrease maternal morbidity and mortality.[118,119,122-125] The vast majority of women who have abortions in Uttar Pradesh and India as a whole appear to be purchasing medication abortion drugs at a pharmacy,[115,117] and improving pharmacists' knowledge and service provision skills would leverage the most common source of abortion services to enhance safety. Continuing to develop innovative pharmacy education services, coupled with new ways for women to assess gestational

age, manage side effects, and gauge completion of the abortion, appears likely to reduce the burdens of time, cost, and mortality on women.

5.3 Future research

The results of these papers point to several areas for further investigation, particularly in the realm of self-managed abortion. First, the intertwined relationship between community-level financial autonomy, individual deviance from the community financial autonomy, and access to resources should be more clearly disentangled. What are the specific components that actually increase women's functional financial autonomy in a way that allows them to translate it into reproductive autonomy? How does having more or less money and ability to spend it how one pleases relate to specific health behaviors and pregnancy outcomes? While financial autonomy is a fairly commonly-investigated form of autonomy with somewhat more straightforward measures (i.e., does a woman earn money that she herself has control over?), the findings from this study that women in areas with more financial autonomy were more likely to have self-managed abortions may seem counterintuitive and should be investigated further.

The suspicion that women in areas with more financial autonomy around them may have been choosing self-management over facility-based abortion would be ideal to investigate with mixed methods research with women who self-managed, in which quantitative indicators on autonomy and status could be collected along with in-depth interviews or other forms of qualitative data collection to delve deeply into women's reasons for choosing—or appearing to choose—self-managed abortion. Are women who self-induce autonomously choosing to do so because they prefer to control the process and the environment in which they abort, or are they alternatively resorting to self-management because they cannot access the facility-based care that they would prefer? Do they have support from their husbands or in-laws in making the decision

to self-abort? At a more basic level, financial data on the actual costs of self-managed abortion for women will also be important to collect for comparison to the costs of facility-based abortion. At a broader level, autonomy is notoriously difficult to measure, and deeper investigation into the context and construction of community norms around autonomy is warranted. Given that this study included only data from women, future work using this or other data should also include partners', families', and other community members' attitudes and behaviors regarding gender, as well as deeper exploration into the environments in communities where abortion and SMA are more or less common.

Additionally, as the MLE Project and this study were not designed as a social network study, there are remaining questions on women's social connections and how they may or may not influence abortion-seeking and attainment. Future research with this dataset could use the associated household survey to delve deeper into dyadic household connections. Future research with different data may allow for examination of larger networks, such as within slum communities or a network of women providing self-managed abortion accompaniment. Innovative methods of data collection such as respondent-driven sampling (RDS) could also provide ways to both increase sample size for the possibility of more robust findings and learn more about networks among women who self-terminate. While some exploratory research with RDS and abortion has begun in other locations, there does not appear to be any work in India that is collecting new, abortion-specific data using RDS.[213,262]

Finally, as there are a number of different types of interventions that have been or could be initiated around self-managed abortion in India, rigorous program evaluation is required. Process and outcome evaluations are key in ensuring that interventions aimed at increasing autonomy and reducing maternal morbidity and mortality do not have the opposite effects.

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